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A

SERIES OF LECTURES,

&c. &c.

BARNARD AND FARLEY,
Skinner Street, London.

A

SERIES

OF

LECTURES

ON THE MOST

APPROVED PRINCIPLES AND PRACTICE

OF

MODERN SURGERY;

PRINCIPALLY DERIVED FROM THE LECTURES DELIVERED

BY ASTLEY COOPER, ESQ. F.R.S. &c. &c. &c.

AT THE

UNITED HOSPITALS OF GUY AND ST. THOMAS,

AND IN WHICH WILL BE FOUND

SOME OF THE OPINIONS OF THE MOST CELEBRATED SURGEONS, FROM THE TIME OF HUNTER, TO THE PRESENT MOMENT:

INTERSPERSED WITH NUMEROUS CASES.

BY

CHARLES WILLIAMS JONES.

SECOND EDITION.

BY CHARLES MINGAY SYDER,

SURGEON.

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TO

ASTLEY COOPER, ESQ. F.R.S.

&c. &c.

SIR,

Much as I regret the appearance of the First Edition of this Work in the Name of "Charles Williams Jones," formerly a Pupil of your's, it is particularly gratifying to have this opportunity afforded me, of doing justice to your professional exertions, by publicly acknowledging that the original ideas of this Series were derived from your Lectures on Surgery, as delivered at the United Hospitals of Guy and St. Thomas.

With the most unfeigned respect for your talents, and the sincerest wish that the Profession may long, very long, possess so valuable a Member,

I HAVE THE HONOUR TO SUBSCRIBE MYSELF,

YOUR MOST OBEDIENT

AND

VERY HUMBLE SERVANT,

CHARLES MINGAY SYDER.

London, June, 1821.

TO THE

STUDENTS ATTENDING THE LECTURES, IN THIS METROPOLIS.

Established 1773
11, CHANDOS St. CAVENDISH Sq.

GENTLEMEN,

IT has been my wish, for the last four years, to see a Work of this description published. It is presented to you in the familiar form of Lectures: and I trust and believe it will be found to contain as concise and faithful a view of the most improved Practice of Surgery, as any Work extant.

I can only assure you, it has been to me a very arduous undertaking: that it may prove as useful to you as a GUIDE *and* DIRECTOR, *as my Friends have had the presumption to anticipate, will be extremely gratifying; and amply compensate me for the great length of time devoted exclusively to this pursuit.*

I am, Gentlemen,

With great respect,

Your very obedient Servant,

THE AUTHOR.

London, September, 1818.

LECTURE I.

I SHALL commence the series with a few preliminary remarks, which will render more intelligible the subjects hereafter to be discussed. The natural temperature of the blood, circulating in the body, is 98 degrees of Fahrenheit's thermometer; the pulsations of the heart in a state of health from 60 to 84 degrees in a minute, the medium is 72, which may be considered the natural standard The pulsations, with respect to respiration, may be considered nearly as 4 to 1, or rather 7 pulsations of the heart to 2 respirations in the adult: in children the pulse is much more frequent, in old age less so; and the smaller in proportion the animal is, the more frequent is the circulation: in children the pulse is very quick*. In the brute creation, as for instance, the horse, we cannot distinguish above 32 or 37 in a minute; in the dog 130. The pulse becomes much accelerated in fevers, from 72 it has risen to 120, 130, 150 and even 160 in a minute, even so quick that it could not be ascertained, and beyond 200 it would be impossible to count it;

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* According to Heberden and Blumenbach, in infants at birth, the pulse is 140; first year 124; second 110; third and fourth 96; seventh 86; at puberty 80; manhood, or 21 years old 75; sixty years of age 60.

the lowest pulse ever known was from 13 or 14 to 28 pulsations, observed by Dr. Cholmley and Mr. Stocker. There are many variations in the pulse denoting the state of the circulation; the action of the heart may be diminished, increased, or changed; as a stronger or weaker pulse than natural, a contracted one, a harder or softer, and sometimes irregular or intermittent. A temperature from 60° to 64° admits with ease and safety every exertion necessary either to our subsistence or pleasure, hence it may be termed *temperate*. The higher degrees up to 70° are called *warm*, and all above that *hot*. In the inferior range a few degrees below 60° is termed *cool*, and all below, *cold*.

The arteries are divided into three orders, the sanguineous, seriferous, and lymphatics, each set conveying the different description of fluids from whence their names are taken: from the minuteness of the vessels this cannot easily be demonstrated, although it is so evident to our senses, as we find parts of the body that only transmit lymph. This is found to be the case in the minute ramifications of arteries called exhalants, and from which that transparent fluid lubricating the cavity of the thorax, abdomen, &c. is derived, and also the insensible perspiration.

The blood is an uniform homogeneous fluid; in three or four minutes after it escapes it begins to coagulate, and a spontaneous separation takes place, into serum and crassamentum.

The crassamentum is found again to be composed of red particles and coagulable lymph, and this can be very easily demonstrated.—

The lymph is of a size-like appearance, and becomes evident from the red particles subsiding from it.

The blood is then composed of 3 parts, serum, the lightest, coagulable lymph, or fibrin, next, and the cruror, or red particles, which are the heaviest of all. Professor Blumenbach calculates that the quantity of blood in the body is about 120 ounces troy; and allowing his assumption to be correct, that two ounces is expelled from the left ventricle at each contraction, and the pulsations 75 in a minute, it follows that 12½lbs. of blood will circulate through the heart every minute, being ¼ more than the whole quantity contained in the body, and the whole of the blood thus passes through the heart 75 times in each hour. The system is soon affected when a vessel or orifice is large, and the animal expires from sudden exhaustion; while, if blood were drawn from a small vessel or orifice, the vessels would be able to accommodate themselves gradually to the loss, and we see in bleeding at the nose, the piles, &c. the blood escapes for days successively, and the quantity lost will be extremely great, and this without danger, while the same quantity drawn suddenly from a large vessel or orifice would prove fatal. Mr. Boyle found the specific gravity of blood to water to be as 1041 to 1000, that is, rather less than one-twentieth heavier than water: Dr. Jurin 1054 to 1000, being rather more. Water at 32° is congealed into ice; even quicksilver becomes solid at a certain temperature.

The blood coagulates without diminution of temperature; if received into a vessel at 96° or 98° equal to its heat, it coagulates equally quick; at 40° it does so later than at 98°; at 100° sooner than at 40°; if stirred continually, it still does so as well. Rest or air was thought to be the cause; but it coagulates when not exposed to either. Mr. Hewson laid the jugular vein of a rabbit bare, and applied two ligatures, at some distance between which a quantity of blood was included: it was left alone 2½ hours, when, on examination, only ⅔ of the fluid was coagulated. It coagulates when in a bladder or gold-beater's skin. Rest does not produce it; air facilitates it. Eight minutes is commonly the time it takes to coagulate:—What a wise provision of nature! When blood escapes in violent hemorrhages, the mouths of the vessels become plugged up by the coagulation, and the bleeding prevented; hence in uterine hemorrhage, or indeed, in any other kind of excessive bleeding, nothing can be more favourable than syncope or fainting, which facilitates, or rather gives an opportunity for this formation. By no means permit or use stimuli in any shape in these cases, as they occasion increased action, which would remove the coagula from the mouths of the bleeding vessels, and the hemorrhage would be renewed; rather let your patient be kept cool, and perfectly quiet. Common and neutral salts prevent its speedy coagulation. Coagula are found in many parts of the body; in aneurismal tumours coagulable lymph is effused in large quantities, and this appears to be gradually forming strata, having a lamellated appearance, resembling the layers of an onion. I shall enter more fully on the nature and properties of coagulable lymph as I proceed in the series: it will be here only necessary further to observe, that it is abundantly deposited under inflammation, and when there is no outlet it becomes organized, and occasionally it is seen to unite the pericardium to the heart, the pleura to the lungs, &c.; and where there is an outlet it peels off as in the bronchia, and is coughed up, when persons suppose they have brought up part of the lungs. The late Dr. Cheston, of Gloucester, had a fine specimen of it. In dysentery and inflammation of the urinary bladder, such large portions have come away as would very much surprise an ignorant spectator.

The sizy buffy coat in inflammation of an important organ seems to proceed from the action of the vessels themselves, according to Mr. Hewson: they perform their office with great force, and the appearance is to be attributed to this strong action, as in pneumonia, &c. This is observable in pregnant women, and as nourishment is to be provided for the fœtus, it only indicates increased action, not disease. In proportion as the animal is strong, so is coagulation slow, while in the weak and faint, as we see in patients greatly reduced, previous to amputation, it coagulates while on the stump immediately after the operation: so, when the blood is sizy, it does not coagulate so soon; it takes half an hour, and sometimes 2, 4, 6, and even 24 hours before this happens, when great inflammation exists: this has been seen in acute rheumatism. Suppose in pneumonia I take 16 ounces of blood away in 4 cups; in the first the blood will be very sizy, in the second and third not much so, and in the fourth not at all. Again, if you draw blood in another person to the same quantity in a similar way, in the first there shall be no size or buffy coat, the second and third shall be very sizy, and the fourth shall be as the first. Some people have great fear of having this simple operation performed, and fear produces a diminution in the action of the heart; hence the latter is to be attributed to this cause; first, when the puncture is made, and at last when the circulation becomes weak. A gentleman had an affection of the chest, and blood-letting being the only relief, he was bled so often as hardly to tinge or stain a white cloth; it is therefore apparent the red particles are slower in being formed than the other component parts of the blood, and also that they do not circulate in the minute parts of the body.

I shall digress a little on the effects of stimuli and sedatives. Whatever increases the strength and frequency of action has been called a stimulus; whatever diminishes it, a sedative. A stimulus increases the momentum of the pulse; a sedative diminishes it: whatever would alter the pulse to hard or intermittent, may be called an irritant.

Stimulants are said to be either common or specific; common are what increase every part of the circulation, as wine, &c., but the greater number are specific, that is, they have a peculiar effect on some particular part; such a stimulus is seen in mercury, in squills, and in cantharides; so also in purgative medicines, as aloes, &c. &c. Some medicines stimulate the arteries alone, and some the absorbents, and those that produce this effect on the latter generally have a contrary one on the former, as digitalis. Arsenic was injected into the jugular vein of a dog, which died in twenty minutes from inflammation of the stomach; so also of muriate of mercury, as will be detailed when treating of poisons.

The effect of stimuli depends on the constitution; hence the immense variety in different applications of medicines. All stimulants are found to lose their effect by repetition; this is illustrated by wine and opium. The utmost stimulating effect of opium is to raise the pulse 15 strokes in a minute, that of wine 50, and this without an adequate sedative effect, whereas the sedative operation of opium is considerable.

Sedatives: these diminish the force and frequency of action; some obviously in the first instance act as a stimulus, as opium; the sedative effects of this and wine bear no proportion; the operation of some sedatives is a direct effect on the nerves; this is demonstrated by injections of opium to the heart or brain; the same of belladonna to the eye; one grain applied, causes such a dilatation of the iris, as totally to disappear; so of lead applied to the muscles of the eye, one or a few grains applied causes paralysis; it has no stimulant effect; neither has digitalis.

The *effects of heat* on the body are universally stimulant. The natural temperature of the blood, as I have previously observed, is 98° of Fahrenheit's thermometer in the human body. A person was put into a vapour bath, heated to 202°, it raised the pulse to 120. In another, whose pulse was 75, it rose to 164. A third person's pulse, exposed to the same degree of heat, rose only to 145. Dr. Fordyce went into a vapour bath of 120°; his pulse rose to 145: going into a dry heat of 254°, he supported it much better. The effect of heat in a warm climate produces quicker growth, and premature old age; the inhabitants arrive at puberty at 11 and 12, and seldom live to 60. In more temperate climates, this does not happen till from 18 to 21, and life is prolonged from 70 to even an hundred years and upwards. The effect of heat on the pulse is to produce a quicker and fuller action; the external veins dilate, and are seen apparently distended in the warm bath, which always produces perspiration, and is a general stimulus; it has great power in exciting the absorbent vessels, and in weakening the body. In *twenty minutes* this power extends to the production of syncope: *in five minutes* it only increases the general tone of the vessels. The hot bath, from 105 to 110 degrees, is productive of uncommon benefit in some scrophulous cases. Violent heat causes blisters to arise; a more violent still, excoriation and detachment of the cuticle; still greater, death of the part and mortification: and of these three stages of burns, the second is the most dangerous, as I shall explain hereafter, on burns and scalds.

The patient dies of excessive irritation when the cuticle is removed extensively, in a few hours. Heat when applied to the body, generally with moisture, as in a poultice, relieves, by exciting perspiration of the part, and unloading the capillary vessels; with the same view, fomentations are used: and to excite the absorbent vessels, dry heat by friction or otherwise, tends to the same effect.

Of *Cold:* its effects are very interesting; though it does diminish, yet sometimes it increases the action of the heat.

Of its sedative effects: I made this experiment while in Edinburgh, which had been done often before; my pulse being 85, I exposed myself to 18 degrees of Fahrenheit's; my pulse became in one hour 76, in two hours 65, then followed sleepiness; its ultimate effect is a sleep, and more remotely, death. In this circumstance, the body is robbed of its heat faster than the organs of respiration can supply it, and when the heat becomes lost, the circulation ceases. Cold, when partially or particularly applied, causes a difference in the heat; the ears and nose, from excessive cold, mortify and drop off, as was very fatally exemplified in Napoleon's campaign at Moscow. The living part of the body may be frozen, and yet restored to life, as has been proved by experiments made on frogs; being completely frozen during a severe winter, they were put on a table before a fire: on the return of warmth, their sensibility returned; they soon began to move, and presently one jumped off. In a case of strangulated hernia, Mr. Cline and Mr. Sharpe applied powdered ice for upwards of forty hours; the consequence was, the part was frozen white and hard, heat restored life to the part, but being too suddenly applied, ultimately caused sloughing. Though cold in general diminishes the frequency of the pulse, yet if applied suddenly, it increases it. A man having a pulse of 80, by plunging into the cold bath, it rose to 120; another person by doing the same, whose pulse was 90, had it raised to 135. I have repeated the experiment, that of trying the effect of a *partial* application of cold, by plunging my arm in snow; my pulse, from beating slowly, became very quick. By the addition of ice to water, lowering it to 33 degrees, my pulse being 81, was raised to 121; at another time, being 87 to 139. It seems to me to depend on the suddenness of the plunge and the irritability of the person; as this effect of cold is irritating, the pulse, though increased, is a contracted one, and thready. I am not aware that the tonic effects of cold have ever been satisfactorily explained. A debilitated person shall have a quick pulse but weak, with heat too on the skin; the effect of cold is to bring down the pulse to its natural standard, and take off the excessive heat; and it is in this way the cold bath does good in weakly habits, and in typhoid patients. It produces a slower and fuller pulse; it does not agree with a plethoric habit, as it causes head-ache, from a determination of blood to the brain. Ice is used as an external application in hernia, and has been strongly recommended by Sir James Earle in burns with the best effect; but I must refer you to the subject itself: do not use it if the cuticle be removed; it has been most strongly objected to. Artificial ice may be made with equal parts of nitre and sal ammoniac mixed. Cold is applied occasionally by means of evaporation; æther is the best to a warm surface, and has relieved in a few hours, as on the temples in severe attacks of the head-ache, &c. Cold applications are had recourse to for removing inflammation, in some cases with good effect. The liquor. acet. plumb. dil. c. spir. vin. rec. is an excellent application; it has this double effect, that of cold, and the sedative effect of the lead; and is very effectual in removing inflammation: few clothes should be put over inflamed limbs. That cold poultices retard the formation of matter, and warm encourage it, must be considered only ideal; heat is so quickly imparted from the body, that unless it is repeated every ten minutes, nearly the same effect is produced from both.

It is deemed expedient that a short digression on *Constitutional Irritation* should still precede the subject of Inflammation, which most authors have immediately commenced their works with.

Irritation is a subject on the knowledge and comprehension of which our surgical treatment will depend; by it is meant an unnatural stimulus. If a stimulus be natural to the body, as in taking food, the irritation is confined to one part. Irritation may be either considered local or general; the effects are produced by the nervous influence, as when a nerve is wounded, it communicates the injury to remote parts. There is an universal connexion of one part of the body with another, but more particularly so in some parts than in others; and this is denominated *sympathy;* by which is meant one part being affected in consequence of injury done to another at a distance from it; although sufficiently obvious, yet this principle is doubted by some. It must happen by the general communication of the nervous agency; the most common and natural is the sympathy of the uterus and breasts. Coughing is an act of sympathy, the effect of irritation in the larynx; sneezing is an act of the same kind. Other instances might be adduced; but my object now will be to treat of diseased sympathy, which is of two kinds.

The one is called the sensation; the other is termed the action of the part. *Examples of the first kind:* When an obtuse pain is felt in the loins, from a diseased testicle. In inflammation or disease of the hip joint, pain is felt through the whole course of the sciatic nerve, from the knee to the foot; and this often proves a source of mistake to the surgeon, when consulted by a person who complains of pain in the knee. The leg should be examined up to the hip joint, to ascertain if it proceed from sympathy. The length of the limb is apparently increased. A stone in the bladder causes pain in the extremity of the penis. A disease of the prostate gland, causes pain at the basis of the sacrum, and not unfrequently in both thighs. A disease of the stomach will produce pain in the left shoulder. A disease of the liver a sympathetic affection in the right shoulder. A diseased testicle pain in the loins. An affection of the mesenteric glands of the rectum produces an itching at the nose. *Examples of the second kind,* or sympathetic diseased action. Diseases in the urethra very frequently produce inflammation of the testicles, sometimes of one, at other times of both.

The glands in the groin are often affected with sympathetic bubo, in consequence of gonorrhœal inflammation, which disappears as soon as the cause subsides or is removed. Hiccup and convulsive action of the diaphragm is a symptom of a mortification. But of all organs to which these effects are produced, none are more frequently affected than the stomach. For instance, if a blow be received on the head, causing injury to the brain, vomiting is the first and almost constant symptom. Vomiting is produced when the testes are injured, or the intestines hurt, wounded, or strangulated; it will often arise from the mere introduction of a bougie, when it is attended with faintness; or from a gall stone passing the biliary duct; or calculi passing through the ureters into the urinary bladder, &c. An obtuse pain in any part may occasion vomiting; but an injury to the stomach itself will be attended with fatal effects. A man walking through Fleet-street quarrelled with a woman; another female came up, and gave him a blow on the region of the stomach, which caused almost instantaneous death. Upon dissection, to trace the cause of his expiring so suddenly, no disease could be perceived. A man belonging to the India House, while lifting a weight, which he was almost incapable of doing, was accidentally struck by another while in the act of extension, and he fell down; no life was perceived in him, and attempts to restore animation were ineffectual; on being opened, there was hardly any appearance deviating from the natural, except a small part opposite to where he received the blow, which appeared red. When the stomach receives a blow suddenly, the diaphragm becomes incapable of respiration; and when inspiration is thus impeded, nature cannot perform her functions, and death is the result. Some substances introduced into the stomach, such as oysters, muscles, &c. will by a sympathy between it and the skin, produce eruptions on the skin. It is by irritation, that corrosive sublimate and arsenic cause effects on the stomach which cure cutaneous affections. Fainting is caused by local irritation, respiration being for the moment suspended. A violent shivering once or twice in twenty-four hours, is often the result of a stricture in the urethra, and is best relieved by opium. Shivering is also caused by the formation of matter, and occasionally by the introduction of a bougie. Paralysis of the lower extremities sometimes occurs in children from irritation in the bowels, and it sometimes proceeds from teething, which will also occasion in them convulsions. A rash may be brought out on the skin by teething, and by costiveness, in apparently healthy children. A suppression of urine has followed the amputation of a limb; and the practitioner is sometimes obliged to desist in the extirpation of the female breast, from the sickness caused by it. Scalds, burns, &c. though occasioning slight local injury, are frequently followed by bad effects. Compound fractures also are often attended with but slight local effects; but in the morning succeeding the accident, great constitutional injury will be evinced, which has been known to mislead the physician, who conceived them to be typhoid. Irritation in the stomach is followed by loss of appetite, vomiting, &c.; the bowels being at first costive, but generally concluding with diarrhœa; the secretion of bile is lessened, consequently the fæces are of a bad unhealthy colour. Vegetable poisons, such as tobacco, introduced into the intestines, produce great relaxation, debility, syncope, &c. Pressure on the brain will stop the motion of the heart to a great degree; but on the cause being removed, it again re-acts. The symptoms of constitutional irritation are pains in the head, back, and loins; the pulse being quick, hard, and generally full, next contracted and thready: when the irritation is great, irregular, and often intermittent, tongue furred; if the irritation be slight, white; if considerable, yellow; if so great as to terminate in mortification, brown, the stomach rejecting its contents, bowels costive, urine high coloured, and when the irritation is ceasing, it deposits a sediment. The effect on the skin is generally cold chills, succeeded by heat and profuse sweating: if slight, once in twenty-four hours; if great, twice, and so on. The symptoms produced by contused wounds, from their effects causing considerable irritation, are often mistaken for fever. The first effects of the accident are pain in the head, back, and loins, tongue white and furred; afterwards brown, and in proportion to its quickness in becoming brown, the violence of the irritation is to be estimated; the mouth dry, appetite lost, and sometimes sickness ensues; costiveness, which if the irritation be of any continuance, changes into purging; pulse preternaturally hard, though not full; the arteries not dilating; when the irritation becomes more violent, the pulse becomes irregular and interrupted, (intermission of pulse in old people not to be considered dangerous of itself, without other concurring symptoms) and sometimes there is a sensation of jerking; respiration quick and laborious; urine discharged in small quantity and highly coloured; the skin dry, and the patient restless; delirium and subsultus tendinum often succeed.

The degree of irritation depends on four principal circumstances: on the size of the wound; on the part injured; on the ease with which it can be restored; and on the constitution of the patient.

The violence of the symptoms in a great measure depends (when the parts are not vitally important) on the irritability or susceptibility of the constitution, and as the latter will be able to resist the influence of irritation, so will it be regulated, for a slight injury occasions violent effects in some persons, while in others they are trifling.

Case. A man who lived intemperately, was bled by the late Mr. Saunders, two days after he was taken ill; on the 5th the arm was inflamed above and below the elbow, and pus was discharged from the wound; his pulse was 120, with delirium. Opium was used both internally and externally, combined with other medicines; on the 6th day his pulse was 110; on the 7th he was purged, and his delirium became less violent; a poultice of bread and water was applied to the arm with opium; the 8th day the pulse was 120, the edges of the wound covered with a brown substance, and having a fleshy feel; the arm discharged a bloody serum; and on the 9th, notwithstanding every assistance that art could devise, he died. On dissection, the skin was found mortified round the arm, the cellular membrane inflamed and suppurated, but the vein which had been opened was uninjured.

Case. An instance contrary to this, of considerable injury without fatal effects, was seen in the person of a brewer's servant, who was run over by a dray; his elbow joint was opened, the bones fractured, and the artery separated from the bone. As he would not consent to an operation, although strongly advised to do so, the wound was closed, it soon healed, and he recovered.

To relieve constitutional irritation, when excessive, or arising from the injury of any vital organ: 1st, take away blood, in proportion to the strength and plethoric disposition of your patient.

2dly. Restore the secretions of the liver, kidnies, skin, and intestines.

In children give calomel and antimonials, for nineteen diseases in twenty in them are inflammatory, and this is the best medicine to restore perspiration, &c.; bathe the feet in warm water: by these means you take off the momentum of the blood, and give a healthy action to the secreting organs.

In adults, it will be better to give calomel at night and saline purges the following morning.

3dly. Lessen the nervous irritability by opium, combined with some sudorific.

And, 4thly, Guide your patient's diet and regimen.

The influence of some passions of the mind, as grief, anger, fear, &c. are evident to us all; and their influence, on diseases, being increased, must be observed with peculiar care and attention by the practitioner. Their effects are almost incredible. *Grief* disturbs the stomach, and is a depressing passion: it lowers the pulse, and particularly affects those organs whose actions are languid, such as the liver, frequently producing in it obstructions and disease. *Anger* has an irritating effect, quickens the pulse, but renders it thready: it retards the cure of disease in general, of inflammation in particular, rendering ulcers ill-conditioned and sloughy. *Fear* augments the quantity of urine, and has the most extraordinary effect of all; from it diseases, not otherwise attended with immediate danger, prove fatal. Instances of this might be enumerated in fractures of the leg, cancers of the breast, stone in the bladder, in which patients have died from excess of fear alone; it is a most depressing passion, and lowers the pulse till it altogether ceases. The passions being a part of the mind, and of the animal functions, powerfully affect the organic or vital functions under disease.

LECTURE II.

ON INFLAMMATION.

When inflammation occurs externally, it is denoted by four marks or signs; these are redness on the part, pain, swelling, and increased heat. It is defined by Mr. Hunter to be a process occasioning, in a given time, and from one immediate cause, the following local effects, viz. pain, swelling, and redness.

The redness is owing to a great quantity of the red globules being determined to the part, and distending the vessels which before admitted only the transparent particles. This is often remarkable in the tunica conjunctiva of the eye.

The swelling in a tumour, proceeds from the dilatation of the vessels from the effusion of coagulable lymph into the interstices of the cellular substance.

The cause of pain is supposed to arise from the distention of the blood vessels of the nerves, and thus making pressure on them. A part inflamed is infinitely more susceptible of pain than the same part when in a state of health. An encysted tumour has been removed from a lady with scarcely any pain being expressed, while the mere opening of an abscess, where the integuments were inflamed, has caused apparent tortures; therefore it would at all times be desirable in amputation to cut, if possible, above all inflammation, for if a cut be made into an inflamed part, independent of the excruciating pain given, the stump will scarcely ever do so well.

This is remarkable in hydrocele; when uninflamed, the injection produces a slight adhesive inflammation; but if it were previously inflamed, the case would be altered; and if precisely the same injection were made use of, the inflammation would extend to the suppurative process.

The heat of inflamed parts has been and remains a matter of question. Hunter denied the existence of it, and made several experiments to support his arguments. He introduced a thermometer into the rectum of a dog, and found it stood at 101; he then injected a solution of muriate of mercury, by which a violent inflammation was produced; on applying the thermometer, there was no increase of heat.

He likewise introduced it into the vagina of an ass: it was then 100; on producing inflammation, it fell to 99; after a short time it rose again to 100, but there was not any further increase.

These experiments, however ingenious they may be thought, are by no means satisfactory. On the surface of the body increased heat is found to arise from inflammation: a blister raises the thermometer to 94, while the parts around are only 90.

That increased heat really exists externally is now universally admitted: Hunter has allowed that the temporary enlargement of the diameters of vessels always happens, whenever there is any process going on requiring an extraordinary supply of blood. He also states that the colouring matter of the blood, the red particles, is its heaviest part, and does even acquire an increase in bulk in inflammation. Now in inflammation, the vessels of the part are certainly enlarged, they allow the red particles to circulate through them, which before in a natural and healthy state, contained only the transparent; this combined with the increased velocity of the circulation, will be sufficient to account reasonably for the excess of animal heat by the greater portion of caloric which is given off, causing the variation in the temperature, and hence it approximates nearer to the heat of the blood, according to the extent and violence of the inflammation.

Inflammation has *four* results or terminations:

1st. Adhesion, from coagulable lymph being thrown out in the cells, and the parts becoming glued together, or incasing the extraneous substance, which was the original source of mischief, and all the symptoms existing gradually disappearing. This process, or stage, by some is termed adhesive inflammation, by others, resolution, and is the most favourable of each.

2dly. Suppuration, or a secretion of matter in the centre: from the continuance of the inflammation, the action of the blood vessels becomes changed, and pus is formed.

3dly. Ulceration, which eventually, by continued pressure, excites absorption of the surrounding parts, thereby allowing the escape of the extraneous body; this is termed ulcerative or absorbent inflammation.

4thly. Mortification or gangrene, in which process the parts losing their vitality become dead, and separate from the living, by the suppurative process taking place for their removal.

Inflammation produces different effects in different parts of the body. In the skin it generally extends a considerable way; besides the cuticle is raised, as in blisters, containing underneath serum, and very seldom producing pus; this is called the Erysipelatous Inflammation. In this affection there is generally constitutional irritation, subsequent to its origin, accompanied by shivering, acceleration of the pulse, depression of spirits, prostration of strength, &c. &c. According to Mr. Hunter, this is a cutaneous inflammation, which now and then spreads over a considerable extent of surface very rapidly, without extending generally to the cellular membrane underneath.

It differs from local or common inflammation, which is of a deep red, by being of a scarlet colour, tinged with yellow, being also more diffused, and not so elevated or circumscribed, disappearing in one situation and attacking another, the colour of the cuticle having a glossy smooth appearance; it is accompanied with a burning itching pain in the part; frequently ending in resolution, but seldom in suppuration.

Inflammation of the arteries also is very extensive, even going to the heart itself. This has been frequently observed in patients who have died from constitutional irritation, after an operation, where a ligature has been made on an artery.

Case. A man in St. Thomas's Hospital, after the operation before mentioned, had a violent inflammation in the artery, which ran on to suppuration. The symptoms attending it were, first, a sense of cold, with rigidity of the joints similar to rheumatism; delirium came on; pulse 130. After death, the inflammation was discovered running along the internal coat of the artery as far as the heart itself. The cure in such cases must consist in venesection and other evacuating remedies. The inflammation is always found to be in the inner coat only.

In the veins its progress is slower than in the arteries; and when it reaches the valves, these generally adhere, and glueing the sides of the veins together, often prevent any further extension of the mischief; but if this fortunate result be not effected, abscesses form in the veins from the continuance of the inflammation, and pus mixed with blood has been seen in the heart.

In the absorbents inflammation may be distinguished by red lines under the skin, feeling like cords, and frequently terminating at the first absorbent gland.

Inflammation of the membranes of large cavities is very extensive, beginning at a point and rapidly spreading, and if recoveries take place it is from adhesion; as the pleura to the lungs, the pericardium to the heart, and the peritoneum to the intestines, &c. &c.

In inflammation of the bones, the pain is obtuse and scarcely to be borne, the constitution suffering more irritation than from the most acute pain.

Case. A woman had her leg amputated below the knee; an inflammation took place in the bone, which caused such an excess of the most excruciating pain, as induced her to submit readily to a second amputation above the knee for its removal. When it continues in bones, its effects are exostosis, in consequence of cartilaginous and bony matter being effused.

In the muscles it produces spasms, as in fractures; the patients are restless for two or three nights, from the effects caused in the inflamed muscles.

Tendons, when inflamed, slough to a great extent, and the reason of this seems to be, the weaker part or action of the living powers in them being diminished; thus, if an abscess form in the finger, and the tendon becomes exposed, it will slough through the whole extent of the abscess.

The nerves are very rarely inflamed; when it happens, the pain is constant and violently severe, increased on the least motion, and may be known by the tremor of the muscles below it.

Inflammation in glands, if general, stops their functions, but if partial their functions continue. In the affection of the liver no bile is secreted.

In the viscera it affects their different functions; thus, in the stomach, there is a violent pain and vomiting, constipation, tremor, and ultimately hiccup. In inflammation of the viscera, the pulse is generally quick and small; this has deterred many surgeons from venesection in these complaints; but without it, in my opinion, there will be but a very little chance of saving the patient's life; but it must not be done sparingly, unless in very feeble and debilitated habits; we generally find the pulse rise in proportion to the extent of the bleeding.

We should likewise make use of local applications; such as cupping, leeches, blisters, &c. The warm bath is highly useful also.

In inflammation of the lungs, there is great difficulty in breathing, pain in the side and head, pulse slow, labouring, and full. On dissection, we generally observe the cellular substance distended with grumous blood, and a serous fluid and coagulable lymph in the cavity of the thorax.

In inflammation of the heart, the pulse is peculiar, feeling double its natural diameter, and very hard; if it be on the internal surface of the pericardium, the pulse is fluttering.

In inflammation of the brain, there is great pain in the head, redness of the eyes, delirium, pulse full and hard, and an extraordinary pulsation observable in the carotid arteries, which you should always take notice of. Here arteriotomy, or opening the jugular vein, gives relief sooner than bleeding in the arm.

LECTURE III.

INFLAMMATION CONTINUED.

Inflammation is divided into two kinds, the *common* and the *specific*.

By the first is meant that before described, as regularly producing adhesion, &c. &c.

In the *specific* the action of the vessels is peculiarly changed, and the effects different.

In the common kind, the action is only increased.

In the specific, it is changed.

The *common*, is called the healthy inflammation, being the means which nature makes use of for the restoration of lost parts. As for example, an artery is divided; here, without inflammation, death must inevitably ensue: ligatures might be applied, but these would be thrown off and separated in from 10 to 14 days; but when this happens, nature makes the necessary provision, inflammation ensues, the internal coats of the vessel throw out or deposit coagulable lymph, and its sides become glued together; and the same effect takes place in every part of the body.

If the constitution be bad, the inflammation is slow, and it is called *chronic:* thus, when the coats of the eye are divided in the operation for cataract, if *healthy*, the wound unites in two or three days; if *unhealthy*, it frequently runs on for a month, or many weeks, being kept up by local and general debility, and the habit of body of the patient.

Specific inflammation is of two kinds:

The first arises from the peculiarity of the constitution, by the simple change of the action of vessels.

The second, is from the effects of poison.

Of the *first kind* is gout, which is an inflammatory action in the joints and tendons, and an earthy or chalky matter is secreted. This depends on the peculiarity of the person's constitution, which causes that particular and *peculiar* action of the vessels, which in common inflammation would produce pus. Cancer is another of a similar kind, produced, owing to some *peculiarity* in the constitution which we are ignorant of, and is generally most frequent about the cessation of the menses in women. A blow, however, may so disorganize the structure of parts, as to produce it in some constitutions, which shows that it does not depend upon any specific poison, but is the result of a peculiar action, throwing out a cartilaginous substance, instead of coagulable lymph, and sometimes a portion of earthy matter in it: it likewise exists often in the uterus. Fungus hematodes is also the effect of a peculiar action of the vessels; it begins by a small blue tumour, which after a short time bursts, and a soft fungus grows rapidly, the lymph effused is soft and pulpy, and the vessels shooting into it grow luxuriantly, having no resistance opposed to them; but cancer grows slowly, the substance effused being hard, and with difficulty penetrable.

Specific inflammation, as the result of poison, is by no means unfrequent; as the venereal, small-pox, cow-pock, rubeola, scarlatina, and hooping-cough: the matter produced in these is of a specific kind, and capable of communicating a similar disease. Thus, in chancre, the ulcerative process is peculiar, true pus being rarely if ever secreted; it is a thin acrid sanious fluid: indeed, when true pus is discharged, it is a mark that the disease is overcome, and the part is returning to a healthy and natural state. The edges of a chancre are very different from those of a common wound, being thicker and particularly jagged, and easily distinguished at first sight; in this case, the process of inflammation is not performed.

Scrophulous inflammation comes nearest to the common; but in this case the ulcerative process is slow, and the matter composed of curds and serum, with the edges of the wound turned to each other. It is generally the result of an original debility, and thinness of the coats of the arteries and absorbents.

We must attend carefully to the varieties of inflammation, and thus vary the remedies, and study to endeavour to allay the predisposing causes, &c.

When inflammation is spontaneous (if ever so) it is the effect of a singular or peculiar weakness, and if once set up extends rapidly. We are, however, to distinguish carefully between the various kinds of debility.

There is one species which arises from stimuli, as any considerable evacuations, and these are the very subjects we would choose to perform operations on.

There is another species of debility, arising in consequence of excess of excitement, that is, broken down by intemperance; these last will never do well under operations, and most generally die, either from compound fractures or other causes.

In debility arising from fevers, the parts of the body pressed upon inflame and slough occasionally to a great extent. Blisters have been seen often, in cases of scarlatina and measles, to extend to gangrene: and in children, the same effects are produced now and then from excoriation, arising from their urine. When the parts become gangrenous, calomel and lime water, forming the black wash, is a very beneficial application, exhibiting Peruvian bark internally, and allowing a generous diet, seldom fail to restore the parts to a healthy appearance.

The original cause of inflammation seems to be, any part of the body put into an unnatural posture or state, when an effort is made in a surrounding part to rectify it, which causes inflammation; thus, if any part be divided, inflammation is excited in the neighbouring parts, and the wound becomes healed; and if any extraneous substance be by any means introduced into the body, an inflammatory action becomes excited, the result of which is, suppuration, by which process the offending substance is expelled. Inflammation arising without any evident cause, is the effect of distention of the vessels of the part; thus cold suddenly applied after heat, produces inflammation of a deep seated kind. Rheumatism, and sometimes an effusion of coagulable lymph, or an abscess, which is often extensive, will form, if there be constitutional debility. External violence from mechanical or chemical means, application of irritating substances, &c. are common causes of inflammation. There can be however but one general cause of inflammation, that is, parts put into an unnatural state.

The proximate cause of inflammation is a matter of dispute. Dr. Cullen's doctrine of spasm of the extreme vessels, is considered not at all conclusive. Boerhaave's opinion of an obstruction in the smaller vessels from the thickness and lentor of the blood, is disapproved of. He admits the vessels are dilated, and allows the mischievous red globules to enter, which he conceived produced permanent constriction. If you examine transparent parts with a good microscope, and to do this, take the web of a frog's foot, you will find that it apparently contains no red blood; but if you excite inflammation by pricking it with a sharp instrument, in a few minutes you will see red particles of blood enter into the vessels, at some little distance from the part injured; they are pushed forward by little and little, till they approach the ramification of the veins, which they immediately enter, and become directly conspicuous, though before they were merely visible: but they are now distended by the vessels behind propelling the blood forcibly into them.

There does not appear to be any evident action in the vessels in the part itself, on the blood which they receive; they dilate and open to receive it, but the action would appear to be in the surrounding parts—a kind of sympathetic action; and if this be an important fact, it extends to the sensorium and heart itself, and causes the constitution to sympathize in severe injuries.

I cannot give you a better idea of this, than by showing you what happens in the eye, when any offending matter gets into the tunica conjunctiva, the lachrymal gland immediately sympathizes, and a flow of tears rushes over the eye to expel the offending substance; did this run through tubes, it would be *exactly similar* to what takes place in inflammation. The action of the neighbouring vessels is increased, and the blood rushes to the injured part: this increased action you may observe in a whitlow on the finger; if you feel the artery in the finger, you will find it much increased in its action from that of the corresponding fingers; and sometimes this increased action extends throughout the whole limb.

How a spasm in the extreme arteries, supporting an increased action in their course, as Cullen remarks, can be considered as the proximate cause of inflammation in all cases not arising from the application of direct stimuli, must be argued on this principle: that when glandular structures are inflamed, they cease to secrete as usual; but this is only when they are generally, not partially inflamed; as in the latter case their secretions become augmented rather than diminished.

Hunter says, inflammation is to be considered merely as a disturbed state of parts, requiring a new salutary action to reinstate them in their original position: it ought, strictly speaking, not to be deemed a disease, but as a salutary operation. Again, he says, it is to be considered as an increased action of the vessels of the part, an increase or distention beyond their original size and diameter; it is not a relaxation but merely temporary dilatation, and a necessary operation performed by nature.

To render this intricate subject as intelligible as can be, it will be necessary to enumerate a few of the preceding remarks.

We are not to consider arteries as tubes formed merely on mechanical principles, to transmit a certain fluid: their muscularity, their elasticity and vital powers being so well known, ought to induce us to give them more important offices; and whatever theory may be hereafter introduced, this ought to be borne in mind; they are temporarily and visibly enlarged in an inflamed part, and that an increase in the circulation of the part is also manifest. How many go thus far and halt, perfectly satisfied; but I should imagine, that let the cause of inflammation be what it may, the first and primary cause of all, must be on the organs of sensation—the nerves of the part; and hence I should say, that the ultimate proximate cause of inflammation, as far as it can be traced, would be, that the sensibility of the part affected becomes increased, that it would appear, if I may be allowed to express myself, as if first susceptible of the injury, and from the intimate connexion of the nerves with each other, they call on their immediate neighbours for assistance; that the command they possess over the circulation, produces a willing compliance, and if the damage sustained be great, is transmitted to the sensorium: nature, ever on the alert, sets about the re-establishment. Hence, if the part be easily repaired, the constitution suffers no interruption in its accustomed functions; but if the part be of vital importance, or the person of an extremely irritable habit, the general frame suffers in proportion to the violence of the injury. When the cause is removed, the nerves gradually resume their wonted powers, the arteries their natural diameters, the circulation its healthy standard, and the integuments their usual temperature: in fact, the *tout ensemble,* their respective healthy avocations.

ON THE TREATMENT OF INFLAMMATION.

INFLAMMATION being a local affection, in most cases, it will give way to local measures, such as the application of leeches, cupping, &c. &c.; but when any vital organ is the seat of it, the constitution thereby suffering and the life being endangered, we must not rely upon local means alone.

In inflammation of the lungs, when difficulty of breathing comes on, and the person's constitution is rather delicate, the taking away a small quantity of blood will be attended with more advantage, than where the contrary plan is followed:

about five or six ounces will commonly answer, and this may be repeated according to the urgency of the symptoms.

Syncope is considered a favourable circumstance in venesection, as proving that the evacuation has acted powerfully on the system. It has been the practice, and I think too very properly, where we have evident marks of high inflammatory action prevailing, of making a large orifice in the vein; two reasons seem to guide this determination, the one, that it will take off the determination of the blood to whatever vital organ is affected, much quicker than if the orifice were small; the other, by no means an immaterial one, that the circulation becomes so sensibly affected, as to induce syncope; the earlier it is practised, and the more suddenly the evacuation the better.

There is an evident advantage in drawing blood as near as possible to the seat of inflammation: for instance, if there be high action going on in the brain, opening the temporal artery, or jugular vein, should be had recourse to for this reason, that the impetuosity of the blood to the part is much diminished in consequence of the neighbouring vessels being considerably lessened in their diameter, and the great distention taken off.

The indications necessary to be observed in repeating blood-letting are, when the blood drawn is sizy, the pulse still remaining hard and above the natural standard; but there is one objection to the former inference, namely, in pregnant women, and also in some irritable constitutions, in whom, when blood is drawn, there is generally a siziness observable.—It also depends upon a quantity of serum in the blood evacuated: if there be a larger quantity or portion, with respect to the constituent parts, than usual, it will be improper to repeat the operation.

A pulse from 76 to 100, with tenseness in the artery, indicates bleeding; but from 100 to 120 not so, as it rather indicates debility, though in the inflammatory state of some important organs, the pulse is often thus; and therefore to relieve any urgent symptoms, it will be proper to have recourse to blood-letting, especially when we find (which is often the case) the pulse gets much fuller after a small quantity has been drawn: but if, on the contrary, we observe the patient's pulse weakened in the pulsatory motion; (a more certain sign, however, is when the blood is taken away by cupping, and the pulse at the time, instead of being slower and fuller, becomes rather quickened) then we are immediately to desist. When any secreting surfaces are the subject of inflammation, and more particularly those of joints, it will be our aim to prevent its extending to the suppurative process; here we must use local and general bleeding, though it should occasion debility in the system.

Purging is considered one of the most effectual remedies in inflammation, for three reasons, the first is, by discharging the fæces, and taking off the irritation produced in the intestinal canal; secondly, by restoring the secretions of the alimentary tube: and lastly, by deriving blood from the surfaces inflamed to the intestines.

For children, calomel with rhubarb to be given every fourth night, if the disease be acute; but if not, every sixth night, as mercury, given too often, may be attended with bad effects. For adults, calomel with cathartic extract, in proportion of a grain and a half of the former, and five grains of the latter, has been considered as very beneficial when given at proper intervals, that is, repeated according to the acuteness of the disease; but if it should not be found sufficiently active as a purgative, it will be better to give, the following morning, the magnesiæ sulphas, or oleum ricini. It is very necessary to be particularly careful in exhibiting the mercurial, especially in scrophulous cases, and in venereal ones combined with the latter affection, when the complaint will be more aggravated than relieved. One of the principal practitioners in town employs mild purgatives of the saline kind—Glauber's, Epsom, or Rochelle salts. Drastic purgatives are to be avoided, of whatever kind, as they produce very considerable irritation in the constitution.

Another mode of lessening inflammatory action is by perspiration, by which the edges of the crassamentum being drawn towards each other, and forming a kind of cup, drains the system of its redundancy, and drives the blood to the surface of the body. Reciprocal affections also take place in the kidneys, by an increase of the urinary discharges. The hot bath is often attended with considerable benefit, and there are other remedies to be given according to circumstances, such as large quantities of diluent drinks, bladders of warm water applied to the extremities, and lastly antimonials; they relieve the oppressive dryness of the skin, and tend to lessen the increased action of the affected part.

The remedies just mentioned are intended for acute inflammation. *Chronic* inflammation requires somewhat of a different treatment; when an organ has laboured long under an inflammation, so as to threaten its entire derangement or dissolution, the hydrarg. muriat. with or without the Peruvian bark, according as circumstances may direct, which may or may not favour the exhibition of the latter medicine, has been found beneficial and serviceable to a great degree.

Case.—A striking instance of this is recollected, which occurred in Guy's hospital, in the case of a woman who had a chronic inflammation of the eyes, to such an extent as to have produced an opacity of the cornea: the common remedies were persisted in, but in vain; when, after taking the above medicine, the opacity of the cornea began gradually to diminish, and in a few days the inflammation subsided. The mercurial, in this instance, was combined with a decoction of sarsaparilla.

In tabes mesenterica, chronic affections, and in scrophula, it answers very well, provided it does not act on the system as a mercurial.

Some of the remedies for *topical* inflammation have been before alluded to, as cupping, leeches, &c.; but it will be necessary to observe, that there are other remedies equally proper; these are cold applications, which are of an astringent or sedative nature, and which, by abstracting heat, lessen the action of the blood vessels, and act as powerful agents on the nervous system; but there are certain limitations to be observed with respect to their use; it would be highly improper to have recourse to them too frequently, or in too violent a degree, as instances have been known, when so applied, they have produced the worst consequences, by freezing the parts, and consequently effecting a morbid action, owing to a lax and torpid circulation. Mr. Samuel Sharp has related a case of this kind, when, from ice being applied to the groin in a strangulated hernia, such a morbid state was induced as to occasion the whole of the scrotum to slough off; but this may be prevented, in similar cases, by enclosing the ice in a bladder.

Evaporating means have been resorted to, on account of their action in extracting heat from the body, by effecting a continual evaporation from the part inflamed, for which purpose the spir. vin. rect. ʒj., liquor. acet. plumb. dilut. vel aq. puræ ℥v. ft. lotio. have been recommended. There are other lotions which act in a very different manner, by being immediate agents on the nerves, thereby diminishing their energy; but these are apt to occasion mischief when too powerful, or long persevered in: as for instance in a case of ophthalmia, where preparations of lead, (liquor. acet. plumb.) were used for some time, and produced paralysis of the eyes. Another case is recollected, when the same preparation was once used through mistake undiluted, in a case of hernia humoralis, where it occasioned a mortification of the scrotum; thus clearly proving that these kind of sedatives act immediately on the parts themselves, and are of no advantage in deep-seated inflammations.

Heat combined with moisture, namely, flannels wrung out of warm water, or the pediluvium, answers well, by producing perspiration, unloading the excretory ducts, and thereby freeing the system of its redundancy: it is on these principles that oiled silk and soap cerate act.

If inflammation should not be got rid of and subdued by the methods mentioned, then, as has been before said, it will be proper to have recourse again to leeches, cupping, and scarifications: the latter are found of great service in inflammation of the scrotum, done by means of a lancet.

In inflammatory affections of any of the internal viscera, blisters may be used to induce a counter-action; liniment. ammon. ℥j. antimon. tartar. ʒij. well rubbed in is very serviceable; this liniment brings out eruptions very similar to the variolous.

In joints diseased with scrophula, or indurations remaining in them, the result of an inflammatory action, these latter mentioned remedies are particularly useful, and more so when assisted by internal medicines, such as calomel given every fourth night, &c.; if the enlargement should not yield, and the joints are stiff, friction must then be used, and persevered in for a length of time; but the use of it is improper when there is inflammation existing.

It is by friction Mr. Grosvenor, of Oxford, has acquired so much celebrity; thus, one hand is rubbed up, and the other down the limb at the same time; and continued for half an hour or longer every day.

The above are the principal remedies for local and constitutional inflammation, and are to be employed with judgment according to the existing circumstances; as it is impossible to lay down rules in a particular way, they must be general ones, and the surgeon must avail himself of those most applicable to the case of his patient: lastly, it may be proper to observe, that in most instances, rest and support will prove advantageous, the antiphlogistic regimen must be observed, and attention paid to the patient's diet; avoiding those causes that would agitate or disturb him, &c.

LECTURE IV.

ON ADHESIVE AND SUPPURATIVE INFLAMMATION.

Inflammation has the effect of changing the blood into three parts, serum, crassamentum, and coagulable lymph, which is different from that in a state of health.

If you put a portion of blood, just drawn, into rectified spirits of wine, you will perceive it harden on the surface; but it does not harden on the under part, which is composed of red particles, and which are easily separated. The buffy appearance is not only found when the system is affected, or if blood be drawn from an inflamed part, but it will have this appearance, though there be no constitutional affection present, as has already been remarked.

In consequence of coagulable lymph becoming attenuated, it is capable, in inflammation, of being poured out from extreme vessels, and inflammation is then taking place when this lymph is effused for the purpose of glueing parts together: we are all of us aware, that if a piece of lint be laid over a wound after this process has taken place, it will so adhere as only to be separated by violence.

Such surfaces as take on this kind of inflammation, are the peritoneum, pleura, &c. &c. and immediately on the commencement, the adhesive process takes place, coagulable lymph is effused, and connects the membranes to their attaching surfaces.

The cellular membrane is very liable to this species of inflammation. On cutting into a tumour, when the process has commenced, you will certainly find a mass of coagulable lymph by attending closely to the appearances, for when first effused it is yellow, and has the consistence of jelly: observe the appearances under the cuticle, raised by a blister; when effused it takes on a peculiar arrangement; on its first appearance you will discover its vascularity, and the parts in contact with its surface begin to shoot out vessels, they become more and more elongated, until they at last shoot entirely into its substance; hence then it is evident that coagulable lymph owes its vascularity to neighbouring vessels.

The uses of this lymph are several; in the first place, it serves to confine pus in the cavity of an abscess: an abscess is capable of producing great destruction, if not prevented by the effusion of this lymph. One case may be related:—it was that of a man much debilitated, who had a tumour on the neck, which, forming an abscess, extended even to the loins, whereas had coagulable lymph been effused, this great extension would have been avoided; the patients, in these cases, are to be considered in imminent danger, though not at first generally so.

The second use it serves, is in dividing a cavity into several parts, so that if inflammation come on in any one part, and pus form, by this process taking place, and glueing the sides of this cavity together, the inflammation is prevented from spreading farther.

Thirdly, in case of any extraneous body, such as, for example, a musket or pistol ball being received into any part of the body, this lymph, by forming a cyst, encases this extraneous body, and the parts around it are not stimulated to do any further injury; and cases where extraneous substances have so remained in the body for a length of time, without any very manifest inconvenience, will be detailed in the course of these lectures.

Fourthly, to unite parts together which have been divided, and which is considered as the most essential of its uses. A very wrong opinion has prevailed, that extravasation of blood produces what is called the first intention, which is now evident can only be answered by coagulable lymph; for example, in the operation for the hare-lip, it has been invariably observed that the less the loss of blood the better.

For the accomplishment of the union of parts, it is absolutely necessary that inflammation should first come on, and during its early progress the lymph is thrown out, which answers every purpose required.

There are two modes of union, the one already mentioned, namely, adhesion, the other by granulations; if there be any exception to this, it is where the hæmorrhage is stopped by a coagulum or clot of blood; but here ultimately the union is effected by the medium of lymph, which causes an adhesion of the clot to the inside and orifice of the artery, and to the surrounding parts; and, in bad habits, the increase or recurrence of hæmorrhage is from a deficiency of this action, and after the ligature operates, the ends not being glued together, nor the clot of blood to the sides of the artery, it is carried away by the force of the blood.

No operation, not even the simplest, could be effected with safety, without the adhesive process; for after the operation of venesection, if it were not for this mode of union, the vein would inflame, and the inflammation extending along its coats, through the valves, even to the heart itself, would necessarily prove fatal. Many other cases could be mentioned illustrative of this subject, such as tapping in ascites, and in the operation for strangulated hernia, where, if the peritoneum and intestines did not adhere, death would be the result; amputations might also be alluded to; and with respect to this latter operation, there is one question I would wish to put to you, that is, why is it found so necessary to save so much of the skin or integuments? to this it may be answered, that it is for the purpose of glueing or connecting it with the ends of the muscles: and from thence proceeds the necessity of cleaning the stump of any foreign body, tending to prevent that desired process, and perhaps it may not be amiss to mention a circumstance which occasionally happens to unskilful practitioners; the impropriety of removing the dressings a few days after the operation has taken place is here alluded to, in order to see how the limb appears, but it must be evident to every thinking man, this is extremely wrong, as it tends precisely to destroy that mode which nature has intended for the restoration of the parts. It is only warranted in those cases where, from the excess of pain the patient complains of in the amputated part, you have reason to suspect there is matter confined, and even in such a case it would be preferable, merely to slip through the adhesive plaster, in order to give vent to the confined matter, without removing all the dressings.

The same adhesive process takes place in the hard as well as in the soft parts of the body, the bones for instance, only that in them, a gelatine is secreted, and in the soft parts lymph is deposited to cover the edges of the fractured bones, either simple or compound: with the exception that, in the latter accident, this process is hindered from being completed by the formation of pus and granulations.

One more proof in favour of the adhesive process will be adduced, namely, in the improved method for the radical cure of hydrocele, for which we are indebted to Sir James Earle; by the effect of an injection, inflammation is produced, and the sides of the vaginal tunic are glued together, so that the whole cavity or bag previously existing, becomes obliterated; we here see that even disease can be cured by the beautiful and admirable process of nature, in itself very simple, which shews the wisdom of our great Creator in a striking degree.

ON SUPPURATIVE INFLAMMATION.

When inflammation passes the limits of adhesion pus is formed, the symptoms are, the parts affected become more prominent, the tumour being harder on its sides than in its centre, attended with a throbbing pain, and a suffused rednessover its surface; this redness generally denotes inflammation in the cellular membrane beneath; a fluctuation is generally perceptible in its centre, which becomes the most elevated part, and appears whitish and soft to the feel. The constitution now, in its turn, is affected, the patient is seized with shiverings, which are more or less violent, according to a combination of circumstances, the pain, before acute, becomes of a dull kind.—These are the general symptoms, but there will be always some little variety, according to the depth it is lodged.

Although Hunter remarks no suppuration ever takes place without being preceded by inflammation, and no pus is ever formed but in consequence of it, yet there are some particular structures which arrive to the formation of pus, without previous adhesive inflammation; in mucous membranes, for example, where, on any stimulus being applied, immediately pus begins to form. We may observe this in the urethra, when a bougie has been introduced, in an irritable habit of body.

Also in the trachea and in the lachrymal duct; and this is a very wise provision of nature, for if those parts took on the adhesive instead of the suppurative process, in most cases it would be attended with fatal effects.

In croup, lymph is produced instead of pus; and fistula lachrymalis is a consequence of an obstruction in the ductus ad nasum.

If we are asked why mucous surfaces pour out pus, and vaporous surfaces, coagulable lymph, it may be answered, that the extreme vessels in exhalant surfaces are more minute, and will not readily admit pus through them, although they allow of coagulable lymph; whereas, in mucous surfaces, the vessels are larger, and pus readily finds its way.

When suppurative inflammation takes place in a wound, it is always preceded by the adhesive process. Granulation is a mode of union where the adhesive process fails; for instance, if a part be wounded by any sharp instrument, and lymph is not thrown out sufficiently for its union, then suppuration commences, and the wound is healed by granulation.

OF THE NATURE OF MATTER AND ITS MODE OF FORMATION.

If we attentively examine the nature of pus, we shall find it composed of serum and white particles similar in form to the red globules of the blood; the usual mode of discovering the difference between pus and mucus is by art, and it has been found that pus cannot be coagulated by the gastric juice, and this was attempted from its being thought to have some similarity to milk; the fluid part of pus can be made to coagulate in a solution of sal ammoniac, and this effect cannot be produced on any other secretion or animal fluid. Hunter also remarks, that pus is constituted, as I have already stated, of serum and white globules, and is more or less healthy in proportion as the white globules predominate.

The specific gravity of pus and blood are nearly similar; it must consequently be much heavier than water, in which fluid it sinks, and occasions an uniformly troubled whitish tinge, while mucus floats and communicates to the water something in the resemblance of stringy or fibrous portions floating in it. Pus has a sweetish taste, which is remarkable, as well as its smell.

It was supposed, till of late years, that pus was formed by the destruction of solids; but this opinion is now very generally exploded: we have several striking examples to the contrary, as in the urethra, where its membranes are rather thickened than otherwise by it; in this case formerly it was contended that the matter discharged in gonorrhœa must be caused by an ulcer in the internal passage. The lachrymal duct also, and many similar structures, such as the peritoneum, pleura, and pericardium; which are always found considerably thickened after the formation of matter. Dr. Hunter first noticed that the dissolution of parts of the body was not essential to the formation of pus: a subject died of empyema, and in the dissection, this fact became apparent; the matter, although the quantity was very considerable, appeared to be formed from the fluids, and not the solids, as no breach of continuity, or dissolution of structure could be observable.

The formation of pus is from the neighbouring vessels, and will be proved by this experiment:—After a sufficient quantity of fluid is raised under the cuticle, by the application of a blister, remove the latter, make an opening in the cuticle, and apply a bit of glass to the secreted fluid, and you will find it, after remaining a short time, similar in appearance to pus, directly proving that it is produced from the mouths of the vessels, and not from the solids.

Pure pus has not the power of irritating the surfaces in contact, being quite a bland fluid: but this is only so when it is in an healthy state, and unchanged; for as soon as any irritating cause has acted on it, or the vessels rather that secrete it, so as to excite a total change in regard to its texture, then the surfaces no longer secrete a mild bland fluid, but what is already effused becomes ichorous, exciting irritation in the adjacent parts; such is the case in bones when exposed, where true pus is seldom or ever formed, of which doctrine we have a simple, but sufficiently illustrative example, in the instance of a nail growing into the skin, the parts become irritated, and instead of secreting pus, are discharging an ichorous matter; as soon as true pus is formed on any sore, inflammation immediately ceases; this latter process is absolutely required for the production of the former, but of no longer utility when formed: for if inflammation continue, or is resumed, it prevents any further secretion. On a part being irritated by any poisonous matter, it directly becomes inflamed, and in it a poison similar to that which was applied, is produced, and if this morbid matter be introduced into the system by absorption, so as to affect the constitution generally, it then brings on fever by its irritation, and generates similar poison throughout the system at large.

We have examples of this in syphilis, small-pox, &c. &c.; in these cases the constitution takes on a particular action, which is continued as long as the cause is applied.

The uses of suppuration are twofold, and are important; 1st. by its covering granulations, and keeping them in a moist state, otherwise no sore could be possibly healed; for if a sore be exposed to the action of the atmosphere, it soon becomes incrusted, and under which matter is confined, which keeps the granulations perfectly moist, so that nature here performs her part without the aid of surgery; the second use it has, is by its pressure on parts so as to cause them to be absorbed, and by that means rid the body of extraneous substances; in this it acts similar to ulcerated parts.

OF ULCERATION.

Ulceration is the absorption of any natural formed parts or solids of the body, but differing from simple absorption in this, that the latter takes up minute substances in contact with the vessels. Ulceration is commonly accompanied by matter, but this is not essential to it, as it often occurs without. It is the result of two circumstances:—

Inflammation, with pressure: but inflammatory action is not of itself the immediate cause of it, but only when attended with pressure.

In aneurism of the aorta, where no matter is formed, the parts in contact with the aneurismal sac, such as parts of the ribs, and the sternum, will become absorbed merely by the mechanical pressure of the sac, producing increased action in the absorbent vessels of those parts; in fungous tumours of the dura mater, the bone will be absorbed without any collection of matter.

Ulceration has a tendency to the surface more generally than to the internal parts of the body, as is seen in cases of diseased thigh-bones; or it may be better illustrated in those cases of matter forming behind the sternum, close to the pleura, where, instead of ulcerating that membrane, it absorbs the sternum. A case of this kind occurred in Guy's Hospital, during my attendance. In the formation of matter also in the abdominal muscles, instead of forcing its way into the viscera, it most commonly finds an outlet on the surface of the body.

The same thing is seen happening also with respect to bones, where matter makes its way to that part of the bone most exposed; these examples shew the admirable wisdom of the Divine Architect, for, were it otherwise, the consequences would be generally prejudicial; and which is accounted for by Hunter thus: although a tumour makes equal pressure in every direction around, it will make its way externally, because interstitial absorption only happens in that direction. Slight pressure from without, Hunter remarks, will even produce a thickening of parts, and hence he infers, there even appears to be a corresponding backwardness to admit disease: both these facts are shewn in the case of fistula lachrymalis, for though the collected matter is nearest the cavity of the nose, still it makes its way externally, and the Schneiderian membrane becomes thickened, so as to prove a barrier against its progress inwardly. He gives five causes for ulcerative absorption, pressure, irritation of stimulating substances, weakness, inutility of parts, and death of them. It takes place readier in the cellular and adipose substance, than in muscular, tendinous, ligamentous, and nervous substances, or blood-vessels. A cicatrix, or newly-formed skin, is sooner acted on, than the originally formed cutis; thus, if an inflammation take place in a patient's leg, that had been previously affected with ulceration, the ulcer will break out much sooner than if the disease had not existed prior to this last inflammation.

The progress of ulceration takes place much quicker than that of restoration, as parts may be so affected as to be destroyed in two or three days, which for their restoration would require twice as many weeks.

Ulceration, although a diseased process, yet is not without its advantages to the body and animal economy, by discharging extraneous bodies from the system; as for instance, a ball; a ligature upon an artery is disengaged in the same manner; sloughing parts are also similarly removed; parts having weak circulating or living powers, are readily acted upon by absorption, and we more frequently see ulcers in the legs than in other situations.

When the body has been long accustomed to the discharge of matter, it is absolutely necessary in stopping this, to substitute other evacuations in its room, or the change will produce apoplexy, or a peripneumonia; these consequences are seen on healing old ulcers of the legs. Surgeons were formerly in the habit of making issues in other places, but purgatives persevered in for some time are now deemed preferable, and sufficient for every purpose.

OF ABSCESSES.

An abscess means a collection of matter in a cyst. In cellular textures, prior to the formation of matter, coagulable lymph is effused, forming a kind of wall or cyst, by means of which the further increase of the disease is prevented and arrested. In the middle of this wall you will observe a partition and a small quantity of matter, which is poured into the coagulable lymph, so that by its pressure it produces the absorption of parts. This process goes on in a regular manner, and matter is still secreted, and the process of absorption continues as long as matter is poured out, till at last, with the assistance of the pressure, the whole is taken up.

The dangers attending abscesses are several. The 1st is, when they are very large and present a vast extent of surface. 2dly. When seated in an organ essential to life, the brain or heart for instance, where the lodgment of a very small quantity of matter would prove fatal; but other organs, such as the lungs and the liver, although very important, do not appear to sympathize with the constitution so much; abscesses in them will be suffered to exist to a great extent. 3dly. When not seated in parts important to life, yet by their pressure on any essential organs, render the case very different. Matter, for example, seated behind the pharynx, so as to press on the trachea, will destroy life. There is one case on record, however, of this kind, which ended favourably, free vent having been given to the confined matter, by an opening into the sac, which relieved the patient from the most imminent danger. 4thly. When matter begins from a bone extending to the surface of the body; and this is the great cause why lumbar abscesses are attended with danger, as bones require to exfoliate before granulation, so that from the length of time induced by this process, which is very tedious, patients seldom recover.

TREATMENT OF ABSCESSES.

When an abscess is formed accidentally, poultices and fomentations are all that is requisite. But in a constitution much worn down by debility, and in indolent abscesses, it would be proper to have recourse to stimulating remedies, in order to excite the system to action, and giving also at the same time tonics with a generous diet.

In opening abscesses, the lancet is the best instrument, and is much preferable to the using of caustic; but after having made an opening, should the abscess not discharge freely, then introduce a probe (the point of which being dipped in nitrous acid) into the orifice. If the abscess be very extensive, the best method after an opening has been made, is to apply around it a roller, only taking care to leave an opening sufficiently large to give vent to the matter; by this plan the sides will generally unite.

It is necessary to be thoroughly acquainted with the time necessary for opening an abscess, as a great deal depends on it. There are some that require an early opening; those, namely, that are situated under the fascia or ligamentary expansion and thickened cutis, the palm of the hand and sole of the foot; and the opening made into them should be very free, as there is no risk in so doing, and it prevents their unnecessary extension.

Abscesses also near bones should be prematurely opened, and those that are near organs important to the functions of the animal economy, such as are under the pericranium, in the eye, the thorax, and abdomen, and also in joints, require this plan. Hunter says, generally a collection of matter should be allowed to break of itself: but it is now considered bad practice to allow an abscess to do so, although the confinement of its contents can do no injury; an opening should therefore be made when there is a conical tapering to a certain point, with evident fluctuation, indicating where nature would, if left to herself, fix upon for the precise spot; but it must not be understood that a premature opening is recommended, except in selected cases.

ON HECTIC FEVER.

It is found (but this depends more or less on the irritability of the patient's constitution), that the system is affected with hectic fever to a considerable degree, according to the extent of the abscess, which comes on sometimes twice a day. Till of late years an opinion prevailed, (and it is even now maintained by some) that hectic fever was caused by absorption of matter; but this opinion is certainly wrong. In proof of this assumption, it is found that hectic fever prevails where there has been no formation of matter.

Case.—An instance of this is recollected which occurred some time since in this city; where a girl was admitted into an hospital for an affection of her knee, accompanied with pain, yet no appearance could be perceived of any collection of matter. Hectic fever came on twice a day, and so reduced her constitution, that amputation was resolved on, conceiving there might be matter formed internally, which could not before be detected. But on examination, the limb was discovered to have nothing of this sort: the only appearance of disease was in the epiphises of the os femoris, which were much inflamed.

This case distinctly set the question at rest, and proved that hectic fever is capable of existing without absorption of matter. Since that time many other proofs might be adduced, that hectic fever often exists previous to the formation of matter. A small ulcer in the lungs may bring on hectic symptoms, while a very large one in the leg will produce no such effect: these are certain and incontrovertible evidences of what has been advanced. The hectic fever is simply this: it arises from sympathy induced on the system by the irritation of some part or parts; or in other words, it is that general disordered state, the immediate effect of irritation. There are three stages of it, the cold, the hot, and the sweating fits; the patient is alternately seized with chilliness, which is succeeded by flushes of heat and copious perspirations; the pulse is small but frequent, with an unnatural moisture of the skin, indicative of debility; urine pale, and rather copious, depositing a sediment; tongue dry and parched; with indigestion, vomiting, and diarrhœa.

This fever, as has been previously remarked, depends on local irritation: we must first diminish or remove the cause before it can be expected to cease; do that, and it ultimately will vanish. Hunter says, when an incurable disease in an extremity is removed by amputation (such as a scrophulous affection of the joints where the suppurative process has been tediously prolonged) the hectic fever immediately begins to abate. "I have known," says John Hunter, "a hectic pulse at 120, sink to 90 in a few hours, upon the removal of the cause. I have known persons sleep soundly the first night without any opiate, who had not slept tolerably for weeks before. I have known cold sweats stop immediately, as well as those called colliquative. I have known a purging stop as suddenly on the removal of the hectic cause, and the urine drop its sediment."

The practice in these cases is plain enough: but where our patients are reduced to the lowest state of debility by some incurable local disease, as in lumbar and psoas abscesses, &c. &c. this plan cannot be pursued; we must therefore endeavour to support the person's strength, and invigorate his vital powers, both by the aid of medicine and diet, by the most powerful tonics on the one hand, as bark, acids, &c. &c. and by nourishing and nutritious food on the other, combined with cordials and aromatics. Sleep may be procured and pain alleviated by narcotics, as opium, cicuta, &c.

Resuming the subject of abscesses, we are not to be surprised to find inflammation come on in a few days after an abscess has been opened, as this is commonly the case. It was generally believed that the admission of air was the cause of it; but this we are certain is incorrect; and to prove it, these experiments were made some time since; a trocar was passed through the skin of a dog, and then inflated with air, yet no appearance of inflammation followed; openings were also made into the chest and abdomen of the same animal, and with the like result. Also it is found, that if the lungs are wounded by any sharp instrument, the air immediately escapes from the bronchial cells into the cellular membrane, puffing it up, as was the case in the experiments made on the dog; and yet after the air has been absorbed, no traces of inflammation could be discovered. The cause of it then is truly this; the dividing of the vessels, which, exciting irritation, produces a change in the parts so acted on. Fomentations and poultices may be continued after an opening has been made, until the granulations nearly fill up the cavity, when the more simple the dressings are the better.

ON UNION BY GRANULATION.

Granulations are those substances which arise from wounded or other injured surfaces, as in suppurating wounds or surfaces of ulcers. Their formation is after this manner; when an abscess is opened, coagulable lymph is deposited, which lines the internal surface of the abscess; after a few hours this lymph becomes vascular; and after the expiration of five or six days (but this depends on the age, constitution, &c.) the whole surface lining the abscess is found to become highly so; the vessels open on the external part of the coagulable lymph, and their termination is in its middle, or internal surface; from the orifices of these vessels, after a little time has elapsed, is deposited another layer of lymph, and thus layer after layer are successively formed, till at last the whole cavity of the abscess is filled up.

The difference existing between this mode of union and by adhesion is this: that in the latter the vessels do not shoot forth from their orifices; and in the former the vessels throw out pus at the same time that coagulable lymph is effused.

Granulations are entirely new substances formed from secreted matter; they are extremely vascular, from the various arteries passing in radiated forms on their surfaces; and it is principally owing to this circumstance that they appear so red, which is their colour when healthy; when livid, or of a pale red, it denotes the languid circulation in the part, and they are considered by no means of a healthy disposition. Their surfaces are generally approaching to a point, and termed convex, and the smaller and more numerous such points are, the more health they indicate.

With respect to absorbents, few can be discovered in their new structure, so that fresh formed granulations have bad absorbent surfaces. But this is not the case with old sores or ulcers, which readily take up any mercurial preparation that may be applied.

On looking at granulations, they appear tender and endowed with great sensibility; this is the case, indeed, with regard to the skin, but it is not so in the other parts of the body; the bones for example; where if granulations form after exfoliation has taken place, we find little if any sensibility adherent in them.

To illustrate this, suppose a blow has been received, or a wound inflicted on some part of the cranium, and the integuments do not unite by the adhesive process, consequently this method by granulation ensues; but previous to this, a thin plate of bone is exfoliated. On touching the granulations, there will be no pain excited; and cases have been known where it has not created the least uneasiness, even by pressure.

The want of sensibility also is applicable to tendons and fascia, except when inflammation is present, which alters the case very materially.

There remains one very important observation to be made on the subject; which is, that granulations applied to each other will readily unite; this is certainly very useful to be known, and is of great service to the practitioner. After amputation, if the adhesive process should not succeed, by bringing the granulations on one side to those of the other side of the skin, they may be made readily to unite; but one caution is here necessary to be observed, namely, that care should be taken that the union thus effected is not partial, as here a sinus would be formed extremely troublesome to get rid of.

OF CICATRIZATION.

When granulations arise even with the surface of the surrounding parts, or a little above them, then the process of cicatrization commences, which effects a covering over the whole extent of the sore; or in other words, skin is formed which spreads over the entire surface of it; this process depends in a great measure upon the inosculations of the granulations which form on the edges of the skin. There is a gradual and uniform contraction from the sides to the centre of a wound during the healing of it; the progress of the granulations *is from the sides*, not the centre of a wound; and thus, if it be a concave one, this fact is indisputable, as the skin becomes puckered or drawn inwardly to a centrical point. In a transverse wound the edges recede by their natural elasticity, but during the healing process they are again approximated, from the contraction of the granulations; and hence it is, that as they contract, the skin becomes gradually elongated, till the progress of cicatrization is complete. As soon as a sore begins to cicatrize, the surrounding skin becomes smooth, and has that whitish cast so frequently observed, with a similar coloured substance, which Hunter conjectured to be the new forming cuticle. It would appear that new skin is derived mostly from elongations of the old; but this is not always the case, as new skin is seen formed in detached portions in the centre of some sores, quite unconnected with the surrounding skin. Now whether this is a new surface formed by the granulations, or a change that they undergo, remains to be ascertained. New formed cutis is less yielding, less elastic and moveable, also thinner and more tender than the original, although in course of time it recovers more flexibility, is less attached, and becomes firmer and more dense; it has a smooth general surface, without the indentations of the original, and the living principle is less active, as it is sooner absorbed than the old.

The cicatrix forms an entirely new cuticle over the sore, and which is very expeditiously done; but not quite so soon with respect to the rete mucosum, as instances have shown with regard to negroes. In the filling up of the parts, it is the general opinion, that the substance restored is similar to that which was lost: this is certainly true as respecting most parts of the body; it is known very well that skin can be re-produced. The cellular membrane also generally acquires its original texture, though at first it is somewhat condensed. Tendons are also readily re-produced; their production seldom takes longer than a fortnight or three weeks; but there are some objections, however, to be advanced against this opinion above quoted.

The muscles are not properly reproduced (and here I am aware that I differ from most writers) but it has been carefully observed the mode of union in them after a wound had been inflicted, and a complete union taken place, was different; on examining their structure, it has always been found that the connecting substance *was tendinous* and *not* muscular.

The ribs also, if their cartilages are wounded, do not unite again by their original structure, but by bone. But a gentleman very eminent in practice, has discovered, that this is not the case as far as regards young subjects, in whom cartilage is commonly produced.

Skin, newly formed, has a redder and more florid aspect than an original formed cutis; the reason is, on account of the full distention of the vessels, so that a cicatrix that is large at first, afterwards lessens, in consequence of the vessels becoming greatly diminished in their diameter.

There is one circumstance to be kept in view in the formation of skin:—a wound which is long and narrow will sooner unite than one that has a circular form; the reason here is obvious; every cicatrix is healed from the vessels of the edges, so that a long one must be united much sooner than a circular one, on account of the vessels in the latter having a further extent to pass to the centre.

LECTURE V.

ON ULCERS.

An ulcer is a granulated surface secreting pus: when *healthy* the granulations have a florid appearance, and the skin forming the edge of the sore is approximating to the surface of the sore: here granulations are no impediment to its restoration. Every wound must become an ulcer, which does not unite by adhesion. Healthy ulcers secrete pus which is white and thick, and not adhering to the surface.

The only treatment required is, first to apply lint to the surface, which will come off after a few days, and when removed, granulations will be discovered under it, and a quantity of pus will be also secreted at the same time, and deposited on the surface of the sore. Poultices must then be applied, as they materially assist the rising of the granulations by their gentle stimulus, and are of greater utility than simple dressings of any ointment. In a few days more they rise as high as the edges of the skin; then lint must be applied, and some unctuous substance on the edges, the simpler the better, as that composed only of wax and oil; but be careful the lint does not touch the edges, as it would greatly impede the healing of the parts, by preventing the shooting of granulations to the skin. A formation of a scab from the evaporation going on, on the surface, will be best prevented by the poultice. This is the treatment required when an ulcer is in an healthy state.

IMPEDIMENTS TO THE HEALING PROCESS.

Mr. Home on the healthy ulcer, tells us, that some superficial ones will not be so disposed to heal when kept moist and unexposed to the atmosphere, as when they become dry and covered with a scab; and it will also be proper here to remark, in his work on this subject, that he discountenances the employment of poultices. The subject will now be resumed.

The 1st impediment is, when granulations arise above the edges of the skin, and are too luxuriant, forming what is commonly called fungus flesh; here bandages are proper, and even a thin sheet of lead applied will be found useful: but if this plan do not arrest their further progress, it will be necessary to have recourse to caustic applications, as the lunar caustic, which should only be applied round the edges; any further extension of the caustic is unnecessary; afterwards cover the part with dry lint.

The 2d obstacle to healing is, when the granulations are too languid, and have a glossy aspect: the coagulable lymph deposited is not rendered vascular, which gives them that semi-transparent appearance; it marks a languid constitution, and want of energy in the vascular system, so that the action is greater than the person is able to support; these granulations grow with greater rapidity than in the healthy ulcer; they are larger, and do not possess that firmness in texture. It will be here necessary to improve the constitution by tonics, such as bark and steel, and allow a generous diet. Stimulating ointments will be required to rouse the parts to action, and the best will be found to be the red nitrate of quicksilver, from 5 to 10 grs. mixed with an ounce of lard: vitriolic lotions may also be used: two grains of the zinci sulphas to an ounce of water, or the diluted nitric acid, in the proportion of two drops to an ounce of water; a tight roller should also be applied, as increasing the vigour of the circulation, and also giving due support, and is effectual in producing a determination of blood to the parts; and Mr. Home here very justly remarks that ulcers which heal while the patient is walking about, are not so apt to recur as those which heal while at perfect rest.

3dly, An inflamed state of the parts, which will prove an impediment to the healing process:—here poultices and fomentations may be recommended, rest should be enjoined, and the bowels kept open.

4thly, Irritable ulcers, according to Mr. Home, are thus designated: "The margin of the surrounding skin being jagged, and terminating in an edge, which is sharp and undermined, the bottom being made up of concavities of different sizes, with no distinct appearance of granulations, but a whitish spongy substance covered with a thin ichorous discharge; the surface readily bleeds, and is painful. Ulcers which occur on the malleolus externus, on the ligament of the patella, and the anterior surfaces of the tibia, are generally of this kind;" and Mr. Home conceives that the periosteum is the seat of this ulcer.

The treatment most generally pursued consists in the application of steam, or vapour from warm water, or with a small quantity of vinegar or spirits added to it; fomentations of poppy heads, of hemlock, or of opium, are very serviceable; a decoction of the poppy heads, and of the recent hemlock dried, if it can be procured, are to be employed. A striking instance of the good effects of dried hemlock made into a decoction, in these irritable ulcers, the author saw in the person of an invalided officer of rank in the country. The hemlock was collected in the summer, and carefully dried, and the old veteran did not feel satisfied unless he had an ample stock regularly in the house by him. It is but fair to remark, this occasionally failed in procuring him accustomed relief, and then he was obliged to have recourse to a watery solution of opium. A decoction of wormwood or camomile is recommended by Mr. Home. Poultices made of marshmallows, or linseed, are useful; but that so frequently used in town, the carrot poultice, seems to agree as well as either; but it is sometimes preferred to mix linseed with it, in the proportion of one part of the latter to five of the former: a change in the applications will be very advantageous in some cases; and the principle of this occurrence is compared with that by which change of air, even to a less salubrious one, often improves the health. It is advisable that a heavy poultice should not lie on the ulcer, but the ulcer rather on it. Mr. Home remarks on this subject, that carbon powdered has been found useful. Ointments are not proper applications; and when warmth has been found hurtful, cream has proved very serviceable; bandages are of course to be avoided.

5th, Indolent ulcers are the very reverse of those previously alluded to; "the edges of the surrounding skin are thick, prominent, smooth, and rounded; the surface of the granulations is smooth and glossy; the pus is thin and watery, being imperfectly formed, and coagulable lymph in flakes appear blended together. The lymph consists of flakes which cannot be easily separated from the surface of the ulcer: the bottom of the ulcer forms quite a level, or nearly so; and Mr. Home remarks, the general aspect conveys an idea that a portion of the skin and parts underneath, has been for some time removed, without the exposed surface having begun any new action to fill up the cavity."

The principal part of the ulcers which are seen in the hospitals are of this kind, although in appearance they vary somewhat from the above characteristic. A healthy, weak, or irritable ulcer, unless healed in a certain time, degenerates into an indolent one, although we see some few exceptions, as there are irritable ulcers which never change their nature. Indolent sores, form unhealthy granulations, which become again suddenly absorbed, and this event is promoted by changes in the weather, anxiety, fatigue, &c.

Treatment.

Mr. Abernethy has remarked, that, generally speaking, whoever could apply a roller or a bandage the most perfectly and securely around a limb, would cure these ulcers the best; and the profession is under singular obligations to Mr. Thomas Baynton, of Bristol, for the very excellent treatise which he has published on this disease, which further elucidates the subject. The treatment consists in strapping the wound with adhesive plaster, and applying a bandage from the foot to the knee (if the ulcers are situated, as we so often find them, between the knee and ancle) to give due support to the circulation. Adhesive plaster is to be applied round the limb, covering the sore both above and below; this is to be so done as to approximate the sides of the ulcer as near as possible: soft compresses are to be then laid on, and afterwards a roller applied. The excess of inflammation is to be moderated by keeping the bandages moist with spring water; or a very diluted solution of the acetate of lead, if considerable:—water generally will be found sufficient; and then there is no necessity to confine the patient; he may use moderate exercise. It may be proper in some cases to apply poultices at the commencement, till the granulations arise to some height; then stimulating them with a solution of lunar caustic, or the nitrous acid diluted, giving due support to the circulation, by means of a roller applied to the same extent as before alluded to; but the preceding plan is always preferable, and will be found more universally successful.

An indolent ulcer is sometimes attended with a varicose state of the vena saphena, and this is found more troublesome to heal than the preceding, and is more likely to recur afterwards. Compression, by means of a common roller, is the most approved mode of treating this state, extending from the foot to the knee, and an horizontal posture. Mr. Home states cases where this has failed; and has practised an operation, that of securing the vein as it passes over the knee joint; he does not divide, but merely tye the vessel: but this plan has but few advocates, if any, at this moment, on account of the very serious effects that have been known to result from its adoption.

6th. When a sore is sloughy, and has a black aspect, it is another impediment to the healing process. The treatment in this case is simple; use a strong solution of nitrous acid, from 50 to 60 drops to two pints of water. Poultices of stale beer, or wine lees, or what is known as crop of beer, which is the remains in the cask after the clear beer has been drawn off, mixed with oatmeal, will be very proper: and in some cases, a table spoonful of yeast added will be an improvement to restore it to a healthy surface.

7th. In consequence of sinuses: the mode of treatment, when they are deeply seated is, to inject the hydr. muriat. in the proportion of 2 grs. to ℥j. of aquæ: it should be used thus strong to excite inflammation, and produce adhesion of the sides. Tinctura lyttæ has been also used to bring on the same effect. A caustic bougie may be also introduced. If the sinuses have two openings, it will be best to make an incision between them both, and to introduce proper applications. A sinus in the rectum (fistula in ano) is not to be cured in this way, and rarely by injection. The reason is, that on the motion or contraction of the gut, the sides of the sinus separate; here a cut must be made through the rectum, the whole length of the sinus.

8th. The next obstacle opposed to the healing of ulcers is, a suppression of the menstrual discharge; when this happens, it is seldom found an ulcer will be at all disposed to heal, and will continue in this state so long as the cause remains. In cases of this nature it is necessary to give stimulants, to excite them to an healthy action, and the best medicine to answer this purpose is Dr. Griffith's mixture, composed of myrrh, steel, zinc, &c. and to the sore the best application will be mercurial ointment, or the liq. calcis: but these local applications will avail little, without we are successful at the same time in restoring the natural vigour of the constitution. Indurations are often observed in those who have obstructed menses in their lower extremities.

9th. Sores are very subject to a fungus state, the effect of extraneous bodies irritating the granulations, commonly attended with bloody serum instead of pus, being of an offensive nature. Nails growing into the skin often produce fungus, by the great irritation they cause; it was usually the custom to destroy this excrescence by means of caustic; but the treatment is evidently improper, as the fungus was always found to grow again; which is not surprising, as long as the cause existed, namely, the irritation produced by the nail, which ought to be cut out in the following manner: put the foot or hand into warm water; suffer it to remain for some time, then scrape the nail through with a piece of glass, put a piece of lint under it, for the purpose of raising it, which being done, cut it off. There is another method, which is, to pass a pair of scissars about one-eighth of an inch in length under it, so as to slit it up; but this latter mode, although quicker, is attended with a great deal of pain. Sores of this description, although apparently so trifling, have been seen to produce such a disordered state of the parts, as to cause the necessity of dissecting into the skin, and also the gland which secretes the nail; but previous to this it will be better to try the liq. calcis, or ung. hydrarg. nitr.

10th. Sores often occur in the lower extremities from diseased viscera, and are generally accompanied with anasarca;—here it is proper to attend to the state of the viscera, as no cure will take place before they are restored to their proper functions. When attended with anasarca, calomel united with squills, and about half a grain of gamboge, will be found very efficacious; also the cathartic extract; at the same time giving digitalis with the bark, twice a day, as tonics are highly proper at the time evacuants are employed. Bandages are here to be applied.

11th. Sores are also found in the lower extremities, with disquamation of the cuticle, and skin abraded: under the cuticle is found a small quantity of serum, owing to a lax circulation of the parts. There are two remedies proper for this disease: the liq. calcis, with hydr. muriat, in the proportion of one grain of the latter to an ounce of the former; dip linen in this wash and lay it upon the sore, over which apply a piece of oil silk, which prevents the linen from being too suddenly dried; upon the oil silk apply a roller, which should extend over all the limb. If the parts are irritated with the above wash, apply the nitrate of mercury united with lard.

12th. There are other impediments to healing, such as a white and callous state of the edges of the sores; in this case apply the ung. hydrarg. and if this should not succeed, it will then be useful to scarify the edges with a lancet. Blistering ointments have also their uses as stimulants. When the edges turn *inwards*, it has been observed that this state is a general attendant on scrophulous sores; apply this wash to the ulcers twice a day—argent. nitrat. ʒss. liq. calcis ℥j. M. and afterwards the liq. calcis alone, as a constant lotion, at the same time strengthen the habit with tonics. It is generally the mark of cancerous sores when the edges turn *outwards.* Sometimes we observe a species of sores not very common, which are attended with a great deal of pain, and yet little or no inflammation present; these are best treated by the diluted nitrous acid, giving at the same time the decoction of sarsaparilla, applying the adhesive strapping on Mr. Baynton's plan, so as gently to stimulate them to produce granulations, and also to cause the skin to elongate over the sore by the cicatrizing process. This variety may come with much propriety under the general designation of indolent ulcers. The plan adopted in most hospitals in town in indolent ulcers, is to foment and poultice at first, and after granulations have formed, to apply the adhesive plaster, roller, &c. as already stated.

Ulcers, with a specific action, will be noticed elsewhere in the course of this work, such as scrophulous, venereal, cancerous, &c. &c. &c.

ON GANGRENE, OR MORTIFICATION.

By gangrene or mortification is meant the death or loss of any particular parts of the body of their vital principle, while the others are perfectly sound. Authors give a distinct definition to the term gangrene and mortification; but this is of very little practical utility. By gangrene they mean to designate that stage commencing with the loss of the vital energy of the part, till it becomes quite insensible, cold, and of a dark discolouration: when they apply the other term mortification. It is the result of two states or conditions of parts: 1st. of high inflammation; secondly of cold. When of the former, the parts are red and painful, and on a sudden the patient becomes easier, the redness disappears, and vesication succeeds, the skin becomes insensible, and of a dry brown livid colour; within these vesications there is contained a bloody serum; the pulse is quick, small, and intermitting; shiverings, followed by cold perspirations, come on; diarrhœa, often delirium and hiccup:

the patient's spirits become dejected, and his countenance assumes a wild cadaverous look.

A different state ensues when the mortification arises from cold; the parts are at first benumbed, and on the exposure to heat are afflicted with redness and pain; the parts are destroyed not by a constant, but by a weakly and frequent inflammation. One species of inflammation has been seen where there is a medium between high inflammatory action and excessive cold, and wherein the patient feels but little pain; this was first noticed by Percival Pott, Surgeon of Bartholomew's Hospital. It most frequently happens to men of a gouty diathesis, who have enjoyed themselves in their youth, and are considerably advanced in life; it commences at the extremities of the toes, and gradually advances to the foot, ankle, and now and then to the leg, unpreceded by any visible inflammation; there are instances adduced by Mr. Pott, where it has occasioned very little pain; in others, during the night, they suffer greatly from the toes to the ankle. The cuticle becomes separated on the spot where it begins, and a darkish red appearance becomes apparent underneath; its progress is mostly slow, but when it becomes unusually accelerated, the patient suffers in proportion. It is by no means confined alone to the male sex, or those in years, but when it attacks youth, it is rapid in its progress, and may, with propriety, be referred to exposure to cold. A remarkable case the author saw in Mary Jenkins, aged 13, brought on from losing her way in the snow. The five toes, to the second phalanx of each, mortified and sloughed; she lost her voice and recollection, which was not restored under a week from the time she was discovered; she ultimately did well.

Some parts mortify sooner than others; in the extremities for instance, owing to a due want of circulation, and a proper degree of warmth necessary for the maintenance of that vigour in the parts. The difference of heat in the calf of the leg and foot has been known to be so much, that the former exceeded the temperature of the latter by 20 degrees of the thermometer. A very curious process takes place in the removal of dead parts, and is as follows:—Around the dead substance, in about two days, there is observable a white prominent line; this appearance is owing to a raised cuticle, under which there is serum: if you look 24 hours hence, attentively, the skin under this line will be absorbed; this process passes very soon through the skin, a chasm becomes formed between the dead and the living parts by the absorption of the latter; the process continues extending, till at length all are taken up except the bone. The process of absorption, in these cases, will be found to be much favoured by the application of nitrous acid: the inside of a bone will require two or three years to exfoliate; this is to be attributed to a languidness in the constitution.

In mortification, when the parts are separated by nature, a very curious and important circumstance occurs, which is, that the arteries, though completely eaten through, discharge no blood, and this is prevented by coagulation in the large arteries, to some little distance from the seat of the mortification.

The predisposing cause of mortification is principally debility; a languid habit is often observable to take place after great weakness has been induced on the system, by the severe attack of small pox, measles, scarlet fever, &c. Sores also are remarked to slough from the use of mercury exciting salivation, so as to produce the same effect, viz. debility; also after considerable hæmorrhage; numerous other instances might be adduced, as any interruption to the circulation; as in hernia, &c.; ossification of the arteries; old age; pressure, by long continued lying in the same posture; but this may be referred at once to debility, erysipelas, and severe injuries, as gun-shot wounds, bruises, &c. &c. Climate, specific diseases; as fluxes, &c. may be also enumerated.

It will be necessary to give a caution here, in amputating the limbs of those persons whose disposition of body is favourable for the formation of gangrene, to take care that they do not lose much blood, as the very worst effects have been known to result from such loss. Inflammation is the proximate cause of mortification; if there be any exception to this, it is in hydro-thorax, but very rare even in this case. Frost bitten parts do not die without previous inflammation.

Treatment.

It consists, in the first place, of local evacuations, such as leeches to the part, scarifying, &c. and to strengthen the habit by a generous diet, and tonic medicines; if the patient have been accustomed to take wine, or spirits of any kind, it will be advisable to allow him them in a moderate degree, so as not to heat him too much; apply spirituous lotions, as spirits of wine and the liquor ammoniæ acet. and camphor combined; turpentine also, in some instances, may be applied warm: relieving the parts by perspiration is proper, for which purpose the stale beer or wine lees poultices are useful; but they should not be used before fomentations and emollient cataplasms have been applied, as the latter are preferable, owing to the inflammatory state of the parts. Hunter advises that all the applications made use of should be cold; but it would be more prudent to consult the feelings of your patient, and warm applications are occasionally seen to sooth and afford ease, where cold would not be productive of the same result. Opium alone, given in small doses, to ease the excessive pain suffered, will occasionally be preferable to its combination with the bark; but be careful, previous to its being administered, to open the bowels gently; these are the means used to arrest the progress of the disease.

If mortification have already begun, apply stimulating poultices, as those already mentioned, stale beer, wine, lees, &c.; but the most advantageous poultice that the author has witnessed, and which has been employed from Hunter's time to the present moment, with uniform success, is crop of beer united with oatmeal, and a spoonful of yeast added to it, and applied cool, and renewed at least twice daily, by it, the progress of the mortification becomes checked, a separation from the living parts effected, and a secretion of healthy matter produced. At the same time give decoction of bark internally, either combined with ammonia or opium, in small doses. If a diarrhœa be induced, unite the bark and opium with the aromatic confection; this has been found to check it: but if it should be prolonged, give the mistura cretæ with opium. If the patient be delirious, apply a large blister on the nape of his neck, and internally give the camphorated mixture, with musk. Bark, in mortification, is combined with other medicines, by some, as the sulphuric acid, by others it is altogether omitted, and ammonia, opium, or musk, substituted; in some patients, bark certainly will disagree and prove prejudicial, under any form; while in others it will be of the most decided advantage. Ward's paste is sometimes made use of with great success; it is composed of the following ingredients, made into an electuary:—Piper. Nigr. ʒij. pulv. emul. camp. sem. fœnicul. in pulv. āā ℥ ss. Mellis Anglic. q. s. ut form. electuar. ʒj. bis terve in die sumendus. This has been found very useful in sloughy and ill-conditioned sores of a scrofulous nature.

Allow the patient a generous diet, and introduce aromatics in it; porter, good beer, wine or brandy may be given.

On the subject of Amputation.

It is certainly not right to operate till after the complete separation of the dead from the contiguous parts, that is, until a line of separation becomes evident, and this is one point among the few on which surgeons are unanimous; because, if you amputate before, you will still have the seeds of the disease in the system: but if mortification be the effect of a wound, or a division of an artery, then you may operate, as here there will have been no predisponent cause to gangrene; also when ulcers are very large and extensive, it may be done with advantage. Parts will often, as has been, before observed, separate without amputation; but if we have reason to suspect that the stump will be very long and tedious, or that it would exhaust the patient in the efforts to repair so extensive an injury, it will be preferable to take off the limb; if the mortification have been considerable, the cure would at least prove troublesome, the stump of a bad form, and ultimately of little utility to the patient. With respect to giving opium, I have omitted one circumstance, it will be better to give it before, than after gangrene has taken place. Mortification is often the result of an ossification of arteries; in old people it cannot be cured by any means that we are acquainted with. Mortification commonly attacks the toes and extremities of tall people, for reasons easily explained, such as a degree of torpor in the circulation of those parts, owing to the great distance from the heart, by which the blood is not sufficiently propelled into them. It now and then is seen to proceed from the most trifling causes imaginable. It has been known to come on from cutting a nail to the quick, (the nail of the toe is meant). A gentleman had, unluckily, cut his nail in this manner; mortification ensued: on examining the course of the arteries, they were found ossified, and it was not difficult to foretel that he would not survive three weeks; which was the case, for he died in a fortnight afterwards. Mortification has been known to proceed from an opening made into a tumour on the great toe. The treatment in these cases consists in the use of fomentations; stimulating poultices; opium internally; wrapping the feet and legs in flannel or wool; applying bottles of hot water to the feet, &c. &c.

LECTURE VI.

OF THE FURUNCULUS, OR BOIL.

A BOIL is a circumscribed, painful, inflammatory swelling, of considerable hardness to the feel, very prominent, and of a dark red colour. Boils are not generally of any considerable size; a cyst is formed in the cellular structure for the reception of the matter, which is generally tedious in its formation: except where large, or when several exist at the same time, they do not affect the constitution. They mostly occur in young people, and are thought to be a salutary operation of nature. In their treatment, the object we ought to have principally in view is to facilitate the suppurative process, by every means in our power: poultices of an emollient nature are to be employed, and an opening made into the most prominent part (which approaches when the process is nearly complete to that of a cone), an early opening is not recommended. The matter is of a thicker consistence than we find formed in abscesses; it ought to be squeezed out, as the whole of it will not readily flow itself. If the boil be large, and very painful, it will be advisable to have recourse to opium: if the patient be much debilitated, bark and the sulphuric acid may be given; mild purgatives are to be employed.

ON THE CARBUNCLE.

A carbuncle is an abscess in which the cellular structure takes on a sloughy state; it differs not from a common process in its containing matter. The first appearance it assumes is similar to a boil, and of a bluish colour, raising a little above the skin, having within it commonly a bloody serum. It can be distinguished from other swellings by pressure, which causes a discharge in several parts of its surface; it occurs mostly in old people, and in those accustomed to a debauched life, as tending in a great degree to debilitate and undermine the constitution. In England we see it preceded and accompanied by typhoid symptoms; abroad it marks the plague and other malignant disorders. Richerand tells us, in some provinces of France there is a particular species of this malignant boil. Carbuncles are occasionally seen very extensive, and the danger is proportionable to the extent and seat of the disease: Sometimes, when on the neck, they are to be considered in a favourable point of view, at other times not so, and this will be favourable or not, according to the concurring circumstances. When in the rectum, the prognosis is unfavourable. As these malignant boils so easily take on a gangrenous or mortified disposition: the same treatment here will be necessary as in those affections. Warm fomentations (the warmer in reason the better) are to be made use of; emollient poultices will also be proper. Stimulants also, as turpentine or the mercurial plaster, &c. may be of advantage. Incisions should be made, which will relieve the skin greatly, by taking off the sloughy substance; but making openings in the very beginning of the disease, with any other view, than that of taking off the distention of the skin, would be improper. When an opening is made, which ought to be done early, squeeze as much of the contents out as you possibly can, without occasioning considerable pain; the constitutional treatment will consist in the exhibition of bark, aromatic confection, opium, &c. as recommended for mortification; allowing a generous and nourishing diet. Porter, wine, &c.

ON BURNS AND SCALDS.

Burns may be divided into three states or conditions:—The 1st. consists in a simple vesication, in which the cuticle remains unbroken.

The 2d. where the cuticle is extensively separated from the surface of the skin, so that the papillæ of the extremities of nerves are exposed, which is most frequently the case, from the application of fire.

The 3d. in which the life of the cutis vera is gone, and where the process of suppuration is absolutely necessary.

The danger of the first state is but little, provided the vesications *are not* disturbed, however extensive they may be, although on this subject there has been a severe controversy: in this state, the Liquor. plumb. acet. dil. et spirit. vin. should be frequently applied cold; the chief object is to keep the blister from breaking, as a considerable discharge would come on: otherwise no great irritation, and consequently no attendant danger arise. The spirit. vin. and acet., also a camphorated lotion, as liq. plumb. acet. ʒss. spirit. camphoræ ℥ss. aq. distill. ℔ ss. ft. lotio, may be applied with the same view.

The danger attending on the second, or that state in which the cutis is bare and exposed, is greater than in the preceding, owing to the increased sensibility of the parts, and it is no uncommon thing for death to take place soon after such an accident, when extensive, in consequence of the system receiving such a violent and immediate shock; in this case you will find the pulse quick and small, and the patient frequently chilly, perhaps every quarter of an hour: so that he ultimately falls a victim to the first impression. It is somewhat curious, and at the same time worthy of remark, that children sometimes die of injuries apparently of a trivial nature: an instance of this occurred some time ago, in the case of a child, who died from a trifling scald on the nates, the same evening of the day the accident happened. Burns produced by hydrogen gas differ in their nature from those arising from other causes, and require a different treatment: in the one case a stimulus is necessary, in the other not. This was ascertained some time ago, in one of the hospitals in this metropolis, from the following circumstance:—A young gentleman, who came from the North of England, and had seen a variety of burns and scalds, in which the turpentine (at that time so much talked of) had been used indiscriminately, and which he averred with success; advised it for a patient in the hospital in which he was a dresser; but the fatal effects of it were very soon obvious; besides this, it is necessary to observe, that should the patient survive the accident, still it is likely that death will take place, from secondary irritation. The practice usually followed is to administer opium and wine, and to apply lime water and milk, for the purpose of lessening the degree of irritability present, and also preventing the increased discharge, which would subsequently take place from the use of the stimulants. The old application, the liq. calcis, with oil, is still frequently used. Where granulations have arisen, as they will, extensively, in a few days, the following lotion is to be applied:—℞. Zinci sulph. gr. vj. aq. fontanæ ℥ iv. M. ft. lotio.; this will, in a short time, produce a new cuticle, even over an extensive surface.

With respect to the third state, though there is no immediate danger, yet there is a remote one, for the skin being destroyed, separates and forms an eschar, which must naturally debilitate the living powers, by calling on them beyond their natural capacity. It is in this state that we find so much benefit derived from the application of the ol. terebinth. first recommended by Dr. Keates; this stimulates the parts, and promotes a quick restoration of them, and it is in those burns where the cutis is destroyed, that it has been used with such manifest advantage and decided success. The author might instance the extensive iron-works at Cyfartha, Pendarren, Douglass, Tredegar, Sirhowey, Beaufort, Nantyglow, and Llanelly, in proof of this assertion; and it is only in those cases where it has been used indiscriminately, that it has afforded any other than a satisfactory result; in some cases it is combined with linseed oil, in others used alone, in the first instance, and afterwards united with yellow basilicon for the subsequent dressings.

In the species before alluded to (the second) it has been already shown that turpentine will be more injurious than otherwise; and in children, if the life of the skin remain uninjured, it is an application of great severity. A case occurred in Guy's Hospital, where the skin was uninjured, which afforded a very good opportunity of judging of its effects. A man was scalded nearly the same in both legs; the white wash was applied to the one leg, and the turpentine to the other—in the former a new cuticle was soon formed: in the latter a sore was produced which was very irritable. A ridiculous objection has been made to what appeared a very convincing proof of the relative benefit of each application; that if two remedies be made use of at the same time, one counteracts the other: but here let one question be asked. Is it not very possible, in case of two buboes, by fomentations, &c. to bring one to suppurate, while, by an opposite mode of treatment, we disperse the other?—Still there can be no doubt as to the truth of those cases mentioned by the dresser, of the efficacy of turpentine in the North of England; but burns, produced by hydrogen gas, are not attended with consequences so serious as others. Mr. Hey, of Leeds, recommends the use of turpentine: but it should not be applied when there is simple vesication, or in the second species, but only when the skin is destroyed.

It will be necessary to distinguish each species as here laid down, and the remedies will be found, by experience, to be those mostly successful; it will now be proper to state in as brief a manner as possible, what other applications and treatment have been advised by authors. Paré, Haldanus, and many others, think no injury will arise from puncturing the vesicles, which they countenance; but the author recollects a case, in practice, which directly bears on this point. Mrs. Baskerville scalded her left foot rather extensively; the vesicles were punctured, and the fluid discharged; but whether there was some peculiarity in her disposition and habit of body, or to whatever cause it may be attributed, so as to leave the puncturing the vesicles totally out of the question, a mortification ensued, and was restrained with difficulty: this case was tediously prolonged, but she perfectly recovered in the course of some time. Now what will Paré and others say, if the medical practitioner (a house pupil of John Hunter's, and a man as capable of practising as any provincial surgeon in the kingdom) attributed the principal mischief originally to the bad practice of puncturing the vesicles, which he most decidedly disapproved of. Sir James Earle recommends ice, or the coldest water, made of a solution of sal ammoniac and saltpetre, to be applied either by means of linen, or that old favourite of the public, in these cases, scraped raw potatoes. Mr. Cleghorn, of Edinburgh, extols vinegar in burns and scalds, to be applied a little warmed; and it must be allowed, that the fact of Hunter's deeming a communication to this effect, from Mr. Cleghorn, of sufficient importance to be published in the Medical Facts and Observations, contributed, not a little, to raise the estimation of this remedy; the vinegar to be applied till the pain ceases, then a poultice, and afterwards powdered chalk. It is not a little curious, that two remedies, diametrically opposite to each other, should have attracted public attention, nearly at the same time. Sir James Earle's, of ice, &c.; and Dr. Kentish's stimulating applications; and I too well recollect Mr. Abernethy's remarks on tetanus, ever to be forgotten; they were to this effect:—that if the warm bath be serviceable in tetanus, the cold one, reasoning à priori, cannot be so, although authors would endeavour to reconcile us to those contradictions; if the cold bath be beneficial, on the same principle the warm bath cannot be advantageous. The author would think, unless right and wrong are synonymous, applications so different cannot universally be useful, unless burns and scalds are found to vary very much from what are generally seen, both as to their different states and extent of the violence. But we must endeavour to draw a line of distinction at all events. Cold applications, it must be allowed, are not advisable in every kind of burns and scalds, neither are stimulating ones; hence let us see if we cannot tempt these two authors of Iceland and of Guinea to approach each other. Dr. Kentish advises the parts to be bathed with the rectified spirits of wine, with or without camphor; then the oleum terebinthinæ with the ung. resin. flav. on lint, on the burns; in the second application, laudanum or proof spirits may be substituted: and the ointment to be mixed with camphorated oil instead of turpentine, or the ung. liquor. acet. plumb., or lapis calaminaris; he then advises powdered chalk to be applied. The first dressings should remain on twenty-four hours.

Very great deformity now and then occurs from the granulations on the chin, adhering to those of the breast: of the thigh, to the abdomen: of the fore-arm, to the upper, &c. &c.: in the former the under lip is drawn down, and the saliva, by trickling over the breast, is apt to excoriate it; here, by putting your finger behind the portion of skin, you can divide it, and then apply adhesive plaster; but should the union be complete, then the operation will be useless, of which several instances could be mentioned. We should, in the first instance, endeavour to prevent its taking place, by interposing some body between, as the deformity is sometimes excessive, and the loss of character certain; the best thing we can do is to apply adhesive plaster over the granulations, and upon this a soft cushion. The same treatment and attention is required for the thigh and fore-arm; it is of no advantage to divide the skin between the arm and fore-arm, the deformity will exist. Sir James Earle has mentioned a case where the chin was united to the breast, on which he operated with benefit.

LECTURE VII.

ON WOUNDS.

Wounds are divided into four kinds:—the *incised*, or those which are occasioned by some cutting instrument; the *lacerated*, or those which are caused by parts being violently torn asunder; the *contused*, or that species arising from a blow happening to a part, by which the vitality of that part is destroyed; fourthly, and lastly, the *punctured*, or those made by a sharp pointed instrument: of all the varieties of wounds, these are the most to be dreaded, on account both of their more immediate as well as remote effects; from this description of wounds arise the locked jaw, &c. &c.

OF THE INCISED WOUND.

The direct effect of this species of wounds, is, besides the separation of the parts, the immediate discharge of a quantity of blood, greater or less, according to the magnitude of the vessels divided. The more remote effect is that of inflammation, and in the course of a very few hours the wound becomes covered with a gluey matter; the first object required is to put a stop to the hæmorrhage, and this should always be done by means of pressure, if it be possible. It is always better to avoid applying ligatures if they can be done without, and in general, pressure, made for the space of five minutes, will be sufficient to stop the bleeding, more particularly if assisted by a dossil of lint on the wound. This suppression of hæmorrhage arises from the coagulation of blood around the extremities of the divided vessels, as well as in the mouths themselves. Then the subsequent inflammation, which always supervenes, is taken advantage of; in order to facilitate a cure of the wound, the edges are brought together by means of adhesive plaster, and adhesion takes place, which glues the edges fast together; in observing the process of nature in healing wounds, the opinion that was formerly entertained of the bond of union, as this process was then termed, between the divided parts, is entirely exploded; no wound is united by the blood alone; it was then thought that a coagula of blood was the uniting medium, but there is only one example of the healing of wounds, in which it happens that a clot of blood acts as an auxiliary to the healing process, and this is in the division of arteries. If a ligature be applied upon an artery, there is a clot of blood immediately formed within this artery, just above the ligature, but it does not become the immediate bond of union: inflammation takes place on the inner membrane of the vessel: coagulable lymph is poured out, and the part ultimately becomes organized by the elongation of the original vessels. But setting aside this one solitary example, we shall not find a parallel one, in which the blood forms the uniting bond. If a muscle or a tendon be divided with a sharp instrument, the reunion first ensues by the effusion of coagulable lymph into the cavity of the wound, and also whenever we are anxious to produce union by adhesive inflammation.

The first necessary step must be to clear away all the surrounding blood, and that between the lips of the wound, and unless this is done, it will prevent the adhesion, by being incapable of being rendered vascular; after this the parts are to be brought together neatly and closely by the adhesive straps, and supported by proper bandages.

In the course of a few days, coagulable lymph having been thrown out, vessels may be traced into this newly formed substance, and these are found to proceed from the divided vessels, as well as from the surrounding cellular membrane. I have seen the tendo achilles of a dog which had been divided purposely, ten days before, at the end of which time the dog was killed, and the process examined; there was about an inch of newly formed tendon, and this was rendered vascular, according to the above-mentioned manner; to produce this, an increased action is set up in the surrounding parts.

It is found that the newly formed part mostly takes on the same structure as the parts to which it is immediately united.

Supposing that it is skin only that is divided, inflammation takes place, coagulable lymph is effused, and this becoming organized from the surrounding skin, by means of an extension of its vessels, a similar substance becomes replaced; the cuticle also is reproduced, and in the course of time the rete mucosum is also renewed, though a considerable time will elapse previous to its complete restoration. If cellular membrane, newly formed, exactly resemble that which previously existed, being reticulated; the cells in the first instance are filled with lymph which causes it to appear denser; but this is soon removed by the absorbent vessels. A similar process is going on when tendons are divided, as well as when injuries happen to the bones. Thus from these examples it is evident that the body is possessed of a power of reproducing a structure like in every respect to that which had been destroyed. To this however there are some exceptions, as has been mentioned, with respect to cartilages, as bone is reproduced, resulting from an increased action in the neighbouring vessels; but if an experiment be made in any young animal, bone is not produced, but cartilage, so that the peculiarity in some degree depends upon the age. A second exception is when muscles are divided, they are united by a tendinous substance. A third is with regard to glands; these are not restored to their perfect state by means of a simple effusion of lymph, they will be found to have arteries, veins, nerves, and absorbent vessels, but no excretory duct, as the original gland had.

It will be found that this union by adhesion will take place between soft parts and bone; inflammation produces a severing of the parts, as the periosteum from the tibia, between which an effusion of lymph is produced, and by being endowed with vitality connects the two parts firmly together. This is often perceived in injuries done to the scalp, as well as the tibia, if the parts are applied together when found separated. This process will take place both in flat and in cylindrical bones; as this is the case the obsolete practice of cutting away a portion of the scalp in fractures of the cranium, is done away with; and formerly, if the periosteum were separated from the tibia, it was the practice to cut it off, which occasioned tedious exfoliations: whereas, had it been laid down it would have united in a short time, and prevented the necessity at all for so tedious a process.

With respect to this union, it will be found not to hold good in an attempt to unite the articulating cartilages and the cellular membrane, or common integuments: one of these is laid bare, as in removing a finger, and the integuments are brought over it, as in the common amputation of a large extremity, they never become united to the cartilage, from a cavity being left, in which a fluid is secreted, which causes a tumour in the extremity of the stump; therefore as this is now well known to happen, surgeons generally pare off the articulating cartilage, until the bones bleed, from which surface granulations arise, which will be sufficiently vascular to unite by the adhesive inflammation.

We are not to be deterred from attempting union by this process, even though the parts are much separated; for if they remain attached by a very small piece of integument alone, they will often unite, though apparently no chance of it existed. A case might here be adduced, which occurred in a near relation of Mr. Astley Cooper's:—A boy playing with a dog, enraged him, when the animal seized the lad by the nose, and nearly bit it off; it hung down by a small portion of the cartilaginous septum: the parts being immediately brought together, in the regular situation, so good an union took place, that the scar is scarcely perceptible, and no deformity is apparent.

When Tippoo Saib, or Hyder Ali, took any English or Sepoys in the Mysorean wars, it was their general custom to cut off their noses, by which they were able to know them again when taken, then they invariably were put to death. In these cases, the native surgeons were in the habit of cutting a triangular piece of integuments from the forehead, twisting it half round, but not entirely separating it, and bringing it in such a manner as to form a nose; the edges of the old wound on the face were pared off, and the edges of the skin brought down were inserted into the face; the form of the nose was supported by parchment, or any other convenient substance stuffed in each nostril, until it gained power to support itself: in the course of some days the integuments thus brought down will unite, and the nose appear a very good substitute for the old one. The scar on the forehead will remain long a mark; but in time it will not be much perceived. In about 24 days after the operation the part which remained whole and twisted round may be removed at the root of the artificial nose, which clearly proves that inosculation must have ensued between the vessels of the nose and those of the cheek. This operation has been successfully performed in the west end of the town very lately.

In animals it has been found by experiments that parts which have been entirely separated, and even transplanted to another animal of a different gender, will unite and become supplied with blood vessels from their new possessor. Some analogical experiments of Hunter led him to take up the fanciful opinion, that he could convert a hen into a cock, by taking out the testes of the latter and inserting them into the abdomen of the former. This he actually tried, and though he did not succeed to the extent of his wishes, yet inflammation taking place, the new substance introduced was supplied with blood from the hen, and remained united there; yet nothing further was observed with respect to the change in the sex. The tooth of an animal just extracted was inserted into the comb of a cock, and this being bound on, united, and remained firmly attached and adherent, being supplied with vessels from that appendage.

Mr. Lucas of Guy's hospital, has a preparation in which the spur of a cock being inserted into his comb, it not only united to this, but even to the bone of the cranium. With respect to similar analogical experiments on man, they have not been carried to a sufficient extent; yet Hunter ascertained that a sound tooth taken from the alveolar process of one person might be transplanted into that of another, and unite. Garengeot mentions a case nearly similar to some of those which have latterly been published, of parts of the body being entirely removed, afterwards replaced, and uniting. He says, a soldier's nose was bit off completely, but on being directly restored to its original situation, it became united. A marvellous case has been told of a man having his nose completely removed, which fell into the gutter, the removed part wiped clean, replaced, and all did well. Few have gone the length of this case.—They will do pretty well for our credibility where they extend only to *all-but* separated, as innumerable instances could be adduced of such cases uniting well; but when they are carried further, in the present state of our knowledge, they only stagger our belief in the truth of the asserted and attested cases.

Case.—A tailor's wife holding a piece of wood for her husband to cut through with a sharp cleaver, unluckily by his aiming a very straight forward blow, nearly, that is, "*all-but*," separated his wife's second finger of the left hand: she came under the author's care, who suggested the propriety of attempting an union: she caught eagerly at the proposal, and this was deemed a very fair case to see the extent union could be carried to; the parts were not entirely detached, but were held together by a small piece of integument only: in a month the finger was healed.

The mode of retaining parts in contact with each other when divided, are two, viz. the application of adhesive plaster, and using sutures. When the first is made use of, it should be applied in the form of slips across the wound, taking care to leave interstices between each for the escape of any matter which may be secreted, or blood which might be effused; for if this be not done, these acting as extraneous substances, will force the lips of the wound asunder, and thus render the suppurative process and granulations necessary to heal it. The exceptions to the use of adhesive plaster to every case of incised wound are but few. In the eye-lids, cheeks, and lips, sutures must be used, on account of the great mobility of these parts; also in the scrotum, after extirpation of the testicle, &c. In wounds that are triangular, a suture had better be placed at the raised angle. When the muscles have been divided transversely, it is in general only necessary that the position of the limb should be attended to, as if it be placed in that posture by which the divided muscles can be relaxed, the edges of the wound will readily approximate; and if a suture through a muscle should be incautiously or erroneously applied, it will occasion inflammation and violent spasms.

Ligatures should never be applied upon small arteries that are divided in incised wounds of parts, for by so doing, a greater surface is left to be filled up by granulations, which might have been healed by the adhesive process. The application of a roller moderately tight upon a stump or wound, will generally be sufficient to suppress the hæmorrhage, even from the second rate arteries, and must remain on 24 hours. However, below the knee, when a leg is amputated, all the vessels of any importance must be tied, as pressure cannot act upon those between the bones, or contiguous to them. There is a circumstance all surgeons that consider the welfare of their patients should avoid, namely, an idle curiosity of opening the wound or stump too soon; the time that wounds ought to be allowed to remain unopened will be from three days to seven or eight, according to the extent and nature of the wound. After the operation for amputation, some are curious and desirous to see how the healing process goes on; in this it will often happen that the adhesive inflammation will give way, and the parts recede, by which suppuration must ensue before the wound can possibly heal. The straps should not be removed under seven days; intervals must always be left between them, that any discharge taking place may have an opportunity of escaping. If there be pain or great inflammation after the amputation, it may be mostly removed by the application of cold water to the stump; if an oozing of blood ensues, by which the rollers and bandages are rendered stiff and uncomfortable, it will be advisable to remove them, but the straps must remain. If a number of lymphatics are divided, the effusion of this fluid will retard the union of the wound.

CONTUSED WOUNDS.

A contused wound is occasioned by the collision of a blunt instrument or surface against a part of the body; under these circumstances, it would be absurd to attempt union by the adhesive process. These wounds are not merely lesions of continuity, but are accompanied with such force and violence done to the substance of the part, that suppuration and sloughing generally ensue, if the force applied have been sufficient to destroy the vitality of the part. In the course of a few hours inflammation comes on, and the absorbents take up the living substance immediately in contact with the dead part, and by this means it is separated from the other. The treatment is to be quite different from that of incised wounds:—carefully remove any extraneous bodies; use leeches, fomentations, and poultices. It is also requisite, if the injury be extensive, to support the constitution under the process. After the bowels have been opened, opium and antimony are the best internal medicines: in some wounds of this description, the bark is found liable to irritate the stomach; hence in these cases it would be better to omit it.

LACERATED WOUNDS.

Lacerated wounds are different from the other species, as the hæmorrhage from them is much less. Sometimes whole limbs will be torn off with little or no blood being lost. Cheselden has related a case which came in St. Thomas's Hospital, where the arm and scapula were torn off, without any hæmorrhage. These wounds are often dangerous, on account of their containing extraneous substances; and they are more liable to be succeeded by tetanus than either of the two before mentioned.

Treatment.—After washing the wound very clean, and removing all extraneous bodies, it may be right to apply adhesive plaster to bring the edges of the wound together, or as near so as possible, to prevent nature from having so large a cavity to fill up as she otherwise would have by granulations; afterwards apply emollient poultices. Leeches may be necessary, and sometimes the lancet is required, if the irritation be great. Opium, &c. must be employed in these cases, the action of the bowels being previously regulated.

LECTURE VIII.

ON PUNCTURED WOUNDS.

When wounds of this description are produced by any sharp pointed instrument, the effects resulting from them are three-fold: they excite inflammation of the absorbent vessels, they may wound the fascia, and they may destroy life by inducing tetanus. With respect to the first species, namely, that *by which inflammation of the absorbent vessels is excited.* The symptoms attendant upon a wound of this kind are as follows: red lines are seen extending from the wound to the next absorbent gland in the course of these vessels; on feeling them they are found to be hard and knotted where the valves are placed. The contiguous glands are enlarged; sometimes matter is formed in the vessels or glands, occurring in the latter; and this also more frequently happens in wounds of the leg and foot than in those incident to the arm, on account of the vessels being larger in the part, and the circulation in the blood vessels more languid.

When suppuration takes place in the absorbents, from the inflammation consequent upon a punctured wound, the constitutional affection and irritation runs extremely high. These wounds are accidents frequently affecting medical men, who are in the habit of opening or dissecting bodies. A pupil in one of the hospitals in this city in sewing up a body, punctured his finger about ten o'clock in the day: at nine the same evening, inflammation came on in the part, and became very considerable; on the ensuing day the local and constitutional symptoms were very severe; in the evening delirium came on, and he died 37 hours after the accident. It is generally thought that the putrid matter was the cause of these violent symptoms, it being inoculated under the skin by the instruments used; but the body was quite fresh, and had been dead but a short time. From this case, and many others which have occurred, and which are seen every season, where no matter of the above kind could possibly have been introduced, it is evident that the severity of the symptoms depends upon the constitution of the patient, for these appearances will arise from pricking the finger or hand with scissars or needles, which could not have putrid matter upon them when entering the skin. Treatment.—Cut a piece of lunar caustic into a pointed shape like a point of a black lead pencil, and introduce this into the wound, and cauterize the whole internal surface of it. When this is done, very severe symptoms are prevented from coming on. If this should not have been done in the first instance, from fear of occasioning unnecessary pain, or too great confidence in yourselves to be materially alarmed about such an injury, at least dilate the wound; should inflammation and pain have arisen, leeches and fomentations must be applied. The antiphlogistic regimen adopted to its full extent; calomel accompanied or succeeded by saline medicines; opium and antimony must be given at the discretion of the surgeon. From imagining that a putrid diathesis existed, many surgeons were in the habit formerly of giving wine, bark, &c. to correct it, and never allowed the symptoms resulted from inflammation; the consequence was, that many died under this plan of treatment.

Mr. Astley Cooper, in dissecting, some years ago, punctured his finger; he had very severe symptoms resulting from it: he did not confide in his own knowledge, fearful he might not be so able to judge of the treatment necessary for himself, so satisfactory, as if well, and prescribing for another; a medical practitioner was sent for, who recommended wine, &c. and Mr. Cooper had the resolution to submit to it for a very short time, but sufficiently long to find it only exasperated the disease: on adopting the antiphlogistic regimen, he got better, though it was a long while before he became perfectly recovered, which change of air materially contributed to.

If the puncture be deep, the nitric acid may be used, as the caustic will scarcely reach the bottom of it; these wounds have been converted by some surgeons into simple incised wounds, by boldly laying them open; but unless the wounds are deep, it is better practice to use the caustic liberally, as it will ever be attended with a prevention of the symptoms.

Although many have attempted to account for the phenomena, attendant upon these apparently trivial wounds, yet a great deal very unsatisfactory and inconclusive has been advanced; every thing depends on the form of the wound; when a sharp-pointed instrument perforates the body, the cells of the cellular membrane are exposed, and the termination of the absorbent vessels into these cavities: hence they become inflamed, and a progressive inflammation is set up in these vessels, until they reach the next gland; but when an incised wound occurs, blood is effused into the cavity, or coagulable lymph, by which the extremities of the vessels, of the absorbents, are covered, and thus are prevented from removing into an inflamed state.

The second species of this description of wounds, are those which penetrate the fascia of any part of the body; dangerous symptoms will here take place, frequently from the matter effused being confined by a tense covering, and unable to make its way out.

Case.—A botanist, in getting over a gate, ran a nail into his thigh, penetrating the fascia; the inflammation was great, a day or two after the accident, and the constitutional symptoms were also considerable; there was a swelling around the wound, fomentations and poultices were used, without any benefit, for some time; it then became necessary to make an incision down to the fascia, which was laid open, and which gave discharge to a large quantity of matter, when immediately the very urgent symptoms, before existing, were relieved. This is to be the mode of treatment in every case of this kind, and the incision must be made free, and to penetrate the fascia completely, otherwise the diseased symptoms will not abate. Mr. Jones applied to the author under the following circumstances:—His son, a lad 12 years old, had, in going into the cellar with his shoes off, trod on a nail or spike, which had entered in the hollow of his foot; he was in great pain, very much disturbed, and had no rest since the accident; the wound was immediately dilated, fomented, and poulticed. Opium was administered with saline medicines, to procure ease; very little relief was obtained during the two succeeding days: when the leg was again examined, it then became evident there was a collection of matter confined under the theca, which the first dilatation of the wound had not reached; a free and liberal opening was made now, by me, through it, by which a large collection of matter was evacuated; the boy was much reduced during his short confinement. He now became easy, slept well, and by the use of tonics and a generous diet, soon recovered.

Mr. Price's servant met with a similar injury in the palm of the hand, and as he was not seen by me, in the first instance, fomentations and poultices were used; ultimate relief, however, was not obtained till a free opening was made through the aponeurosis, when every untoward symptom disappeared.

The third species of punctured wounds are those where nerves are affected; when these occur tetanus is produced. Though tetanus is not always arising from injuries of the nerves alone, as it will frequently be induced when wounds of tendons have occurred of a slight nature, either in the hands or feet, but mostly in the feet; this may be considered rather a medical disease, and comes with greater propriety under the province of the physician, yet, as it is a consequence of wounds, it is right to notice it here.

It is divided into trismus and tetanus: trismus when confined to the muscles of the jaw and throat only; tetanus when the whole body becomes more or less affected: and this last species when the body is bent forwards, is called emprosthotonos: when bent backwards, opisthotonos. It commences with general uneasiness and restlessness; the suppurative discharge from the wound suddenly diminishes, and at length totally ceases; the surface becomes puffy and dried; at first red, afterwards marbled. This phenomenon is accompanied with acute pains, which are increased by exposure to the atmospheric air, and by the slightest touch of external bodies. The pain continues to extend till the whole limb is affected; the wounded parts inflame; the muscles are seized with convulsive twitchings, accompanied or preceded by violent cramps; a stiffness is felt about the neck, similar to that brought on by cold: the jaw becomes fixed; the muscles of the back are then affected, which produces opisthotonos; the muscles of the limbs next; then those of the abdomen; these are hard, but the body is not bent equally forward by the spasms in them: the limbs get stiff, and the countenance has a peculiar smile on it, termed the risus sardonicus; the last muscles becoming affected are the diaphragm and intercostals. The pulse is extremely quick previous to death, but it has never discovered intermission in it, which would indicate spasm of the heart; cold perspirations pervade the body. The muscular irritation extends rapidly; deglutition becomes difficult, and in a short time impossible, on account of the forcible constriction of the pharynx and œsophagus. Although occasionally delirious, the functions of the brain however remain uninjured to the last moment of existence, so that the unhappy patient sees himself dying. When tetanus is general all the muscles are affected at once; the limbs become straight and immovable. The opisthotonos happens more rarely than the emprosthotonos, and it has been observed to be more speedily fatal. By the forcible extension of the vertebræ of the neck forcing back the head, a compression on the spinal marrow is produced, and a permanent constriction of the larynx and pharynx. The immediate causes of death may be imputed to the pressure on the abdominal viscera, the derangement which the organs of respiration experience, to the stricture of the heart, and eventually to the congestion of the brain; and these appearances are confirmed by dissection.

The disease is divided into two species; the acute and chronic: the former proves so rapidly fatal, that little opportunity is afforded for the exhibition of medicines, and what has been given and done has mostly failed in arresting its progress. The latter has often been relieved, and has sometimes got well spontaneously. D. J. Larrey tells us, "Experience shows that tetanus left to nature is in all cases fatal;" the surgeon then ought to have recourse without a moment's delay to such means as the disease indicates, to remove the causes of irritation, and re-establish the suppressed excretions. In the former, opium, camphor, musk, castor, &c. and venesection, tepid bath, &c. have been often tried, and as often failed. In these cases, indeed, no reliance can be placed on such medicines; and with respect to opium, though apparently it has sometimes proved its beneficial effects, yet it frequently has been given to a great extent without any service being derived from its use. Mr. Stocker, of Guy's Hospital, gave an ounce of the tincture of opium at a dose without its producing any sensible effect; the man died. On the medical treatment little can be said that would promise success; I shall therefore select two passages from D. J. Larrey's excellent work, which is more expressive on this subject than any other that I have perused. "Would it not be better to remove at once the wounded limb by amputation the moment the symptoms of tetanus appear, than to wait for the resources of nature; and of the very uncertain remedies we possess for the cure, which so rarely takes place?" The unexampled success he met with ought to encourage its adoption.

In the chronic species more has been attributed to medicines than they deserve: Persons in these cases will often recover without a grain of physic. The cold bath has, we are told, been used with advantage, so also has the warm. I must here, from the testimony that has been adduced, favour the cold bath. Relief has been afforded by the administration of large doses of steel, in the form of the tinctura ferri muriat. and ferri sulph., as well as from the free use of opium, and other antispasmodics, in this species.

Trismus will be induced from slight injuries, or from cold alone; but it is not dangerous; the electric aura will frequently remove it, and will be found to have more influence than any other application, or medicine, in its removal; it must, however, be applied merely in the form of aura, as it will only exasperate the affection, if it be given in the form of sparks or shocks.

WOUNDS OF ARTERIES.

When arteries are wounded, they may generally be discovered to be injured very readily, by the blood being of a florid red colour, or by its escaping per saltum; syncope will be produced, which will have the effect of arresting the progress of the blood to the wounded vessel, and consequently put a stop to the hæmorrhage, for the time being, at least; this affords an opportunity for the vessel to contract in diameter, and also to be closed by the formation of a coagula of blood in the mouth of the vessel, therefore, during this state of the system, a salutary effort of Nature is going forward, and ought to be encouraged, and not, as is usually the case, prevented by the administration of stimulants, &c. The manner in which the hæmorrhage is suppressed is as follows:—when syncope is induced, the artery contracts, not exactly at the extremity, but above it, as far as the first anastamosing branch; this will resist the flow of blood from the heart; the second circumstance assisting this, is the retraction of the artery; its drawing itself within its sheath, and blood which will become in a coagulated state, is accumulated round its extremity: and this will satisfactorily account for the stoppage of the bleeding, when the artery has been *completely* divided, which resists every application when only *partially* so. The third principal circumstance is the sealing up of the end of the vessel by a clot formed within it, that is, formed within the cavity of the sheath, and projecting a very little way into the mouth of the vessel; this principally suppresses the hæmorrhage, by its external pressure. These three circumstances always occur when an artery is divided by means of a sharp cutting instrument.

But when an artery is torn asunder, the mode of bleeding being stayed, is rather different. Arteries, in these cases, seldom bleed any. The cellular membrane here is twisted around the vessel, and acts in the same manner as a ligature. A man had his thigh torn off by the recoiling of a cable in a Margate hoy; he was taken into an hospital, and the stump was amputated; the end of the artery had exactly the above-mentioned appearance. He recovered, for no bleeding happened at the time of the accident; this, however, is not always the case, for sometimes arteries are torn off, leaving the mouths open and completely exposed; in these cases the texture of the vessel is destroyed by the extending power made use of, and this may be proved by experiment on the dead subject, for if an artery be very much lengthened, its circular form is altered, and it will collapse in a similar manner to a vein. Contused wounds of arteries do not shew themselves as very dangerous until some time after the accident has been received, namely, at the period when the sloughs separate. A person received a contused wound from a fall on the neck, nothing particular occurred at the time, and the man appeared going on well, but on the sloughing off of the bruised parts, a portion of the carotid artery came away along with them, and the man died instantaneously, from the effect of the hæmorrhage. Punctured wounds of arteries produce every appearance of aneurism, and require the same operation.

Arteries have three coats: the *external,* which is white, dense, and very elastic; the *middle* or thickest, composed of muscular fibres, arranged in a circular form; and the *internal,* which is extremely thin and smooth, possessing, considering its delicate structure, considerable elasticity and firmness, in a longitudinal direction, but weak, and easily torn in the circular.

We have ample proof of its vascularity, and it has been inferred that it is by no means destitute of sensibility. Arteries are connected with their sheaths, by means of fine cellular structure: thus, when divided, they are capable of contraction as far as the first anastamosing branch, and retraction within their sheaths; they possess a similar structure to other parts of the body, being supplied with arteries, veins, nerves, and absorbents; hence they are as susceptible of change as other parts of the body, and as able, when injured, to repair that injury, by a similar process, by the adhesive inflammation.

When pressure cannot be employed or trusted to suppress hæmorrhage, ligatures become necessary. But for the immediate and suddenly arresting the profuse flow of blood, the application of a tourniquet will be required; it cannot, with safety, be continued long, and its extent of operation is confined to the limbs. Every surgeon ought to understand the form and method of applying this instrument; if on the lower extremity, the best place will be about one-third the length of the thigh downwards, as the artery will be here passing close to the bone, and consequently easily compressed. If the upper extremity, about $\frac{2}{5}$ths downwards, on the inner side of the biceps muscle. Temporary pressure may be made in the groin, on the femoral artery, by means of a key or something of the kind, and under the clavicle on the axillary artery also.

From Dr. Jones's truly valuable work on hæmorrhage, the intentions of applying ligatures are these:—To cut through the internal and middle coats of the artery, and to bring the wounded surfaces into apposition, thus allowing of the formation of a coagulum of blood within the artery, exciting inflammation, and causing an effusion of lymph, which glues the clot to the sides of the vessel; the using and applying ligatures, so as to divide the two coats, seems to be the desirable end to which we should be directed; as when applied to an unwounded artery, a complete obliteration of the canal will be effected; hence broad flat ligatures, as used formerly, are objected to. The ligature ought to be round, firm, and not too thick, and applied as *circular* as possible, and drawn round the vessel with sufficient tightness, then apply a knot; always tie a large artery as separately and distinctly from surrounding parts as possible; and Dr. Jones coincides in opinion with Mr. Abernethy, that it is the safest and best to use two ligatures, and to divide the artery between them, in cases especially of aneurism; and when large arteries are divided, this plan ought to be pursued; ligatures usually separate from the largest artery in about a fortnight, from those of less size, in six or seven days. Never use force to detach them, but gentle efforts may be attempted, at each dressing, after the above period has elapsed.

When an artery is divided, or becomes impervious, blood is supplied to the limb, thus deprived of its nourishment by the principal trunk, by means of the enlargement of the collateral or anastamosing branches. When the accident happens in the carotid artery, the jugular vein must necessarily be divided.

OF SECURING THE ARTERIES.

The carotid artery may be tied without disturbance to the functions of the brain. Hebenstreit mentions a successful case of this vessel being tied, wounded in removing a cancerous tumour. Mr. Abernethy secured this artery, in a large lacerated wound on the neck; but his patient died. This experienced surgeon recommends the incision to be made on that side of it next the trachea, where no important parts are exposed to injury, carefully avoiding the par vagum in the ligature.

The subclavian artery has never been tied above the clavicle; but Mr. Keate had a case in which he successfully put a ligature upon this vessel, under the bone; but it would be much better to make the incision above it, on account of the artery being more superficial in this situation: below, a great deal of care is requisite to avoid the subclavian vein and cephalic vein, and the thickness of the pectoral muscle will add to the difficulty of applying the ligature.

The axillary artery has been successfully tied by Mr. Hall, of Cheshire, wounded with a scythe. Mr. White, of Manchester, details an unsuccessful instance; but on dissection, three of the nerves were found included in the ligature. It is very seldom necessary to secure this vessel from a wound in it, as it is seldom seen injured; in cases of amputation, at the shoulder-joint, it has been repeatedly operated on; it is rather a difficult thing to do this, from its being surrounded by the axillary plexus of nerves, from which it must be very carefully separated.

The brachial artery is closely accompanied by the median nerve; this artery has been frequently injured in bleeding from the arm. When this is the case two ligatures will be required, otherwise hæmorrhage will occur, in consequence of the blood being returned into the lower part of the wounded artery, through the medium of anastamosing vessels.

Note.—The operations for each of these arteries will be found detailed under the article Aneurism.

The ulnar artery must be distinguished from the cubital nerve accompanying it; the vessels must be taken up with a tenaculum; the situation may be readily found by bending the arm and hand, when the tendon of the flexor carpi ulnaris will come into view; the artery may be found on the inner side of it; the nerve, however, is between it and the tendon: two ligatures are required on this vessel, one above, and the other below the wound.

The radial artery is more frequently wounded than any other artery in the body, on account of its superficial situation, and it may be found on the outer side of the flexor carpi radialis; if two ligatures are not applied, it is liable to form a tumour of an aneurismal kind, from its anastamosing with the rami from the ulnar artery; it should be taken up with a tenaculum, for though no nerves are present here, yet the tendons being numerous and small, may be accidentally included in the ligature. When this vessel is divided, where it passes down between the thumb and fore-finger, on the back part of the hand, an incision must be made on the lower extremity, and it must be tied; as the other end is apt to be retracted among the tendons, it is recommended to tie the vessel on the fore-part of the wrist, where the pulse is felt.

The femoral artery is occasionally divided; it must be tied under the edge of the Sartorious muscle, as in the operation which will be detailed hereafter for popliteal aneurism; avoiding the anterior crural nerve, and the femoral vein.

To tie the popliteal artery, accurate knowledge and great presence of mind is required, as the vessel lies so very deeply imbedded in the muscles, the sciatic nerve must not be taken up instead of the artery. Mr. Cline saw a case of aneurism where the nerve was taken up instead of this vessel, and included in the lower ligature, the consequence of which was the death of the patient speedily. The nerve is much more superficially seated, and is on the outside. The popliteal vein is between the two.

When the posterior tibial artery is wounded high up, the operation is attended with a great deal of difficulty. An incision must be made four inches in length: this will lay bare the gastrocnemii muscle, the fibres of which must be divided transversely, in order that they may retract and allow of more space for the surgeon to find the vessel; they should only be cut across, on the inner side, as the artery is situated here; the posterior tibial nerve must be avoided. A person who did not well understand the anatomy of the parts, would be deterred from operating, and be inclined to use lint and sponge, but which ought to be reprobated, as in two instances of this kind, where these were employed, mortification ensued from the high degree of inflammation induced by their remaining in the wound. When the artery is wounded lower down, it may easily be found just behind the malleolus internus. In wounds of the interosseal artery, Mr. Hey, of Leeds, recommends a portion of the fibula to be sawed off; but it is not, except in very rare cases indeed, in the least degree necessary, as the vessel may always be found by making an incision close to the inner side of the bone where it lies.

The anterior tibial artery, in like manner to the posterior, is very difficult of access, when requiring to be tied at its upper extremity, but when lower down, it is easily discovered. In a case published by Mr. White, this vessel was wounded high up, and he used sponge with success; and this mode of treatment would be advisable, as the difficulty of tying it is great: when wounded on the foot, it is very evident to the feel, and ought to be secured.

LECTURE IX.

ON WOUNDS OF VEINS.

The largest vein that can be found on the external surface of the body may be wounded without any serious consequences resulting from it. The axillary vein is sometimes injured during an operation for the extirpation of the lymphatic glands in the axilla, yet the hæmorrhage, from this large vessel, may be easily restrained by the application of a dossil of lint to the mouth of the bleeding vein. The ſemoral vein, close to Poupart's ligament, has been seen to be completely divided by a gun-shot without any immediate bad effects, though from the nature of the wound, the patient ultimately died. Although it may be said that generally no important consequences will follow the division of a large vein, yet, if inflammation take place in the vessel, dangerous symptoms will arise, though the divided vessel be only of the second or third class in point of magnitude. The truth of this remark is amply proved by numerous examples. In the simple operation of bleeding, patients have died from the inflammation which has been induced in the vein, and which was formerly attributed to the puncture, either of a nerve or a tendon.

The symptoms, denoting an accession of this inflammation, are a large or broad chord, felt under the skin both above and below the wound, in the vein: this is different from the hard line perceptible to the touch, when an absorbent vessel is inflamed, as in this latter case the tumefied vessel is not larger than a pack-thread, while in an inflamed vein it is as large as the little finger: when this symptom exists in a vein, matter is formed within it; this is contained in a cyst, and sometimes bursts externally, making its way through the coats of the tumour: or the coats of the tumour give way, and the matter becomes mixed with the venous blood. This circumstance of inflammation and suppuration in a vein, after bleeding, is more commonly occurring in animals than in the human species. It was from these that Hunter first discovered the cause to arise from inflammation, which was formerly placed to the account of an injured tendon or nerve. The causes of the affection are these :—the size of the wound; from its not being carefully closed, and from the patient not being possessed of a healthy stamina. The treatment of these cases will be the same, in the first instance, as used for inflammation, and if not subdued, then by fomentations and poultices applied to the part itself, and evaporating lotions to the other parts of the vein and arm, as the spir. vin. camph., &c. When inflammation happens in a vein, Hunter judiciously advises us to apply pressure on the vessel above the seat of the injury, so as to prevent its extension, and confine it within certain limits, thus facilitating an adhesion of the sides. Mr. Abernethy remarks, in some cases it will be actually necessary to completely divide the vessel, with this intention, to arrest the progress of the inflammation; Mr. Samuel Cooper observes, "Might it not be better to put a ligature upon the suppurating vein above the affected part?" The answer clearly is, "certainly not;" and the following remarks will explain this subject.

A ligature on a vein is a much more dangerous operation than what surgeons in general are aware of. It has frequently been made use of to cure varices in the veins of the lower extremities more particularly, and some few years ago it was put often in practice, but at the present time it is strongly reprobated, on account of the fatal consequences which have resulted in a number of cases; in three or four which the author has in his recollection, the vena saphena major was tied to effect the cure of ulcers and varices of the legs, without any mischievous consequences; but other cases have been witnessed, in which the patients died. It was then thought the mere division of this vessel would be sufficient, as it was very rightly conjectured, the ligature produced the bad symptoms; this was often done with success, but two cases happened nearly at the same time, which terminated fatally. On the whole, it is strongly recommended, not to operate in either way, if it be not, in consultation, held to be advisable, as the reputation of a young surgeon might be entirely blasted by an unfortunate case of this description; and if any thing further be required to forbid this practice, it is, that there has not occurred one case where the disease was cured by its adoption (setting the fatality of it out of the question) unless a bandage was worn constantly afterwards, and as this bandage alone will always relieve, if not entirely cure, which it does frequently, it is much better to use a roller and evaporating lotions, accompanied with a purgative medicine occasionally. Numberless cases yield to this mode of treatment; but even if it do not succeed, it is by no means prudent to resort to the above operation, which ought to be strongly deprecated.

WOUNDS OF THE NERVES.

When a nerve is divided, the effect is a destruction of the sensation and voluntary motion in the part to which that nerve was distributed, and a partial loss of involuntary motion in that part; the power of arterial action is not destroyed, though it is most certainly weakened. Nerves, when divided, will unite again, so as to carry on the actions of the part in a greater or less time, according to the size of the nerve. A small nerve will require from ten to twelve weeks, a large one from four to six months. The sciatic nerve was divided in a fracture, when six months elapsed before the patient could use his limb in the least. Electricity assisted very much this case. The brave Kosciusko had his sciatic nerve cut across in a battle in Poland, by a sabre: many months after, he came to England, and was obliged to be carried from one room to another. When union takes place, it is effected by means of the formation of ganglion; but if the extremities are very distant, union happens through the medium of a narrow nervous substance. If nerves are only partially divided, from their state of extension and tenseness, they will occasion excessive pain, and it will be advisable to make a complete division of the vessel, when it can be so ascertained. The only treatment it is possible to adopt, will be to place the ends of the nerves as nearly in apposition and contact as possible; the rest of the cure must be left to Nature.

WOUNDS OF TENDONS.

These wounds arise from two causes:—from cutting instruments, and from the action of the muscles. The tendo achilles appears to be mostly divided, and the treatment, in this case, may be extended to the division of tendons in other parts of the body: pay attention to the relative situation of the incised muscle, with respect to its flexion and extension. The heel of the patient must be raised, and the foot extended as much as possible; in order to secure the foot in this position, a piece of adhesive plaster must be bound circularly round the calf of the leg, but previous to the application of this, a broad piece must be applied from the sole of the foot, over the heel, to the calf, at its posterior part; the circular piece is then to be put on, with the intention of securing and rendering the longitudinal piece firmer in its situation; it is, therefore, to be secured above it. The slightest dressing must be applied to the wound, if there be any, and not the least pressure made upon it. However, if there exists much inflammation, leeches and fomentations must be had recourse to, to abate it, previous to the use of the plasters: great care must be taken to avoid pressure upon the ends of the tendon, otherwise it would be glued to the posterior part of the tibia and muscles, and thus prevent its motion in a great degree. The patient is to be confined to his bed four or five days, at the expiration of which time he may get up, but must immediately have a high heeled shoe put on, to prevent the rupture of the newly formed tendon, which would certainly take place, with very little exertion, if this were not done—he may be allowed to walk a little. The shoe should be one inch and a half high at the heel at least, and must be worn four or five weeks, gradually taking it down to its level.

Mr. Hunter ruptured his tendo achilles in dancing, and was supposed to be the first who improved on the old method of treating this accident, it being the practice formerly to stitch the ends of the tendons together. From his observation and experience, and what he reaped from others, particularly in the case of the Duke of Queensberry, he has completely established his mode of treatment as the best. Dr. Alexander Monro, of Edinburgh, met with this accident—he was confined five months by the treatment employed, which is more complicated than what is now practised.

There is a partial rupture either in the tendon or some of the fibres of the gastrocnemei muscle occasionally occurring, always ensuing from muscular exertions: at the time it happens the patient has a sensation of being struck on the part with a stone, he becomes lame, and a hollow may be perceived where the fibres have given way; there is a slight ecchymosis from extravasation of blood in the part: if it be neglected, the patient will be lame for the remainder of life.

July 9th, 1815, Col. Williams, of the 2d Garrison Battalion, met with this accident from a very trifling cause: making rather a longer extension in his walking to hear the news brought by the mail of the victories of the Duke of Wellington, he put his foot on a round stone and slipped. The author adopted the following plan: he pressed the muscle down, and applied a roller to retain it in that situation; his stocking was put on, and a cabinet-maker in the town immediately made, under his inspection, of splints, a permanent apparatus to retain his leg and foot immovable, and in an extended posture; it was fixed on the foot and on the calf of the leg, and answered every intention perfectly, making not the least pressure on the ruptured tendon,—an evaporating lotion was occasionally applied, —this was continued on for a week, but he was not confined at all to his bed; a high heel shoe was then substituted, and by being careful in his steps he was enabled to bustle about stoutly; the heel was gradually depressed, and he recovered with scarcely any lameness.

On the 23d of January, 1816, the Colonel completely ruptured the tendon; the same means were again employed, and with the same success;—he was however advised to continue the use of the high heel shoe longer before it was diminished. The lameness gradually lessened, and he found much benefit from putting his leg under a water spout every morning, which seemed to strengthen it very much.

Whether partially or completely divided, the same intentions are to be kept in view.

WOUNDS OF THE ABDOMEN.

These may be divided into two kinds, namely, those which penetrate the parietes of the abdomen, without injuring any viscus; and those which enter the cavity, and wound some one or more of the contained viscera. It is singular that very large wounds have been made into this cavity, without wounding any of these parts: this is arising from their eluding the blows, in consequence of their great mobility and lubricity. A curious case, illustrative of this fact, was seen in a lady who divided the abdominal muscles and peritoneum from the ensiform cartilage to the symphysis pubis, with a razor, without injuring in the least degree the intestines. In these cases, where none of the viscera are wounded, which may be known almost always by the attendant symptoms, the gastroraphe must be adopted as soon as possible, which means the sewing up of the wound, in order to shut up the cavity; then apply adhesive plaster, and a proper bandage to support the parts in contact: in some cases the common interrupted suture will be best, if the wound be not very extensive. The antiphlogistic regimen must be adopted. Bleeding, purging, &c. must be had recourse to in order to obviate any undue degree of inflammation which will come on.

In the second case, where some viscus, as the stomach, is wounded, there are, immediately after, faintings, vomiting of blood, and the contents of this organ; as well also as some of it being discharged from the wound, paleness, cold sweats, pulse scarcely perceptible, &c. In some few cases, where the wounds have been small, the patients have recovered: here nothing must be taken by the mouth for a week; let the patient have strong nutritive glysters administered to support him, with opium; at the end of the week he may take a little jelly; in ten days a little broth, &c.; and so on at the discretion of the practitioner. It will be necessary to bleed largely, and an attempt must be made to effect union by the adhesive inflammation.

If a surgeon be called to a wound in the intestines, and the gut does not protrude, nothing local can be done; we are not warranted to enlarge the opening: opium must be administered and large bleedings had recourse to; and although the pulse will be feeble and weak, yet the antiphlogistic regimen must be strictly adhered to:—but should the intestine protrude, the nature of the injury will be very obvious; and if the wound be only a very small one it may be returned, as in all probability it will unite by the adhesive process; but if *not large, yet sufficient to let the fæces escape*, it may be closed by the application of a ligature *around* the orifice, cutting the ends of the thread close off. In an operation for strangulated hernia, performed at Guy's Hospital, Mr. Astley Cooper found the intestine wounded, and the *small* opening he included in a ligature, and the man did very well. Mr. Travers says, that a ligature applied round a portion of intestine acts in a similar manner to one applied on an artery; the inner coats become divided, the external (the peritoneal) remains entire: from the interior coagulable lymph becomes deposited, and an union effected.

Mr. John Bell recommends one stitch only, and the ligature to be attached with the gut to the external wound. Mr. Travers tells us, that the absolute contact of the everted surfaces of a divided intestine, in their entire circumference, is requisite to secure the animal from the danger of abdominal effusion—and that wounds amounting to a direct division of the canal are irreparable, and invariably fatal.

Dr. Smith, of Philadelphia, tried Mr. John Bell's plan on dogs; but in both instances they died from extravasation of fæces in the abdomen. Mr. Travers made the same experiment on four dogs, and he allowed the intestine to retract into the abdomen. Mr. Travers made one experiment with three stitches, cut the threads away, and returned the gut, being in all five cases, which were fatal: thus Dr. Smith and himself seem, as far as inferences can be drawn from the brute creation, to controvert Mr. John Bell's plan.

Longitudinal wounds must evidently be easier repaired than transverse, and the cause Mr. Travers assigns is, that they maintain a state of approximation by their longitudinal fibres resisting the action of the circular.

From what Mr. Travers has premised, he advises stitching a bowel at as many points as possible; now from the following experiments this does not at all seem necessary. Mr. Astley Cooper repeated an experiment made by Duvergers, in which he had succeeded, on a dog—the interrupted suture was used. The trachea of a calf was included in the gut, and three stitches were employed to bring the divided intestine into contact; on the fifteenth day he killed the dog, and found the union complete. Mr. Cooper made another similar one, omitting the trachea of the calf, and the animal did well. Dr. Thompson divided the small intestine of a dog, and used five stitches—he cut the ends of the ligatures off, and returned the gut; the wound externally was secured with one stitch—and he also succeeded. Dr. Thompson repeated the experiment, and in six weeks he killed the dog, when it became apparent that the ligatures employed would make their way into the intestine, and be evacuated with the fæces; cutting the ends of the ligatures off was originally recommended by Mr. Benjamin Bell.

Thus we have five experiments in opposition to Mr. Travers's assumption, exclusive of those made by Dr. Smith, who employed four stitches with equal success.

Thus it would appear, that, unless there is a complete division of the tube, from three to four sutures are all that is necessary, and in the latter case probably it would be advisable to make as many as five: one fact is clear, the ends are to be cut off close to the intestine—that I believe is universally agreed on:—it would appear, that inflammation is much more violent and unrestrainable when the small intestines are wounded than the large. It has been recommended by some speculative surgeons, to introduce one end of the gut into the other, when divided; if these gentlemen had attended more to experiment, and less to theory and some fanciful notions of their own, they would have been convinced of the impossibility of effecting such an absurdity. In all these wounds the apparent debility, weakness of pulse, and coldness of the extremities, would deter many from using depletion; but if not done, the patient inevitably sinks.

WOUNDS OF THE LIVER, &c.

Wounds of the liver, when small, as those made with a penknife, may be recovered from, but if larger they are fatal: the patient is seized with vomiting, great pain, &c. A rupture of the liver, from blows or carts going over the body, is universally fatal. A wound of the *spleen* is ever fatal; and it is rather singular, that this viscus may be entirely removed without detriment, yet the smallest wound will inevitably occasion death. There is a case recorded by a surgeon, who found a wound made by a sabre in the person's side, and the spleen hanging out; the surgeon cut it off, closed the wound, and the man recovered. Mr. Coleman and several others have removed the spleen in dogs with impunity. A man resisting a press-gang received a wound in the spleen, only half an inch in length, from a dirk; a great hæmorrhage followed, and the patient died from the extravasation of blood acting as an extraneous substance, by which the peritoneum became highly inflamed. A woman died from a ruptured spleen, occasioned by a blow from an ox's foot; a part of it was found broken off. In the expedition to Walcheren many died from intermittents, and the spleen was found to be enlarged and diseased in them. Wounds of the *kidneys,* in some few cases, have been recovered from, but the reverse generally happens.

LECTURE X.

ON WOUNDS OF THE CHEST.

These are divided, in a similar manner to those occurring in the abdomen, into two kinds: viz. those that penetrate the parietes alone, without injuring any of the contained parts; and those that wound some of the viscera. When a wound of considerable size is inflicted, coming under the first species of the above-mentioned classes, the following symptoms are evident: when the patient inspires, the viscera recede from the wound, and we are able to see into the cavity of the chest: when in the act of expiration, that portion of the lung opposite the external wound is protruded, so as to become quite visible. There is also a considerable quantity of air rushing out at the time, so that an appearance is produced that would lead us to expect, reasoning à priori from this symptom, that the lungs were perforated; whereas, in fact, it is occasioned by the wound extending through the pleura costalis. The treatment of this species of wound is very simple, and consists in approximating the lips of the wound, by means of sutures, in order that they may be kept in contact; between the stitches slips of adhesive plaster must be applied. In the case of a boy who fell from a tree upon a stake, though the wound thus produced was a ragged one, yet it united by adhesion. It is very requisite to apply sutures, on account of the variation in the size of the chest, resulting from respiration.

When wounds of the chest are accompanied by injury done to the contained parts, the most decided treatment is necessary; if the lungs are wounded, the circumstance is known by the patient's coughing up frothy blood, at the same time there is considerable hæmorrhage from the external wound, and if the wound be made with a sharp instrument, this is often in great quantities; the patient has extreme difficulty in breathing, and more especially if the external wound be small: emphysema is also produced by the escape of air from the bronchial cells into the cellular membrane covering the chest.

The treatment required must be guided by the space of time that has elapsed since the accident was received, for these wounds are attended with danger of three kinds after the accident; first, from the quantity of blood lost; secondly, from inflammation of the lung on that side of the chest; and, thirdly, from suppuration, or hydro-thorax; as matter sometimes forms at a distant period after the accident, as well as an effusion of water takes place. With respect to the first, it is necessary to stop this, by taking away a large quantity of blood from the arm suddenly, as this bleeding must be carried so far as to produce syncope, when the hæmorrhage from the wound will cease, and then the edges of the wound may be brought into contact by sutures and adhesive plasters, previously cleaning away any coagula which may have been formed between the edges of the wound. Secondly: If inflammation arise, and the patient be suffering considerable pain between the scapulæ, as well as in the head, it is right to repeat the bleeding, and this must be done very freely: those are most likely to recover who have been depleted copiously, and many have been seen to die for want of this boldness of practice: the most perfect rest must be observed, and the antiphlogistic regimen strictly enjoined; every thing given should be cool.

The bleedings have been carried by some able practitioners to a great extent in these wounds—it is what is principally to be relied on for the recovery of the patient. In emphysema the air soon becomes absorbed, and it is seldom necessary to make small punctures in the cellular structure for its discharge, unless the collection is very great.

If extravasation of blood into the cavity of the chest, from the wound in the lungs or intercostal arteries, happen, as it very frequently does, the difficulties are increased and the danger of the patient's dying from suffocation imminent, many advise the endeavouring to evacuate the effused blood—others prefer leaving it to be absorbed: the compression on the lung must be great, yet the danger of making fruitless efforts partially to get rid of it is still more serious, besides occasioning very probably a renewal of the hæmorrhage; it would be all very well if the blood remained in a fluid state, in which case it might, by dilating the wound, be got rid of, combined with posture.

The third danger is that in which, in spite of our efforts, the inflammation goes on to suppuration, and the effusion of a fluid; under these circumstances the symptoms arise at a distant period. An example of this kind occurred some years ago in Guy's Hospital; a man attempting to arrest another was stabbed between the shoulders with a penknife, which wounded the lung: the wound healed, and it was thought that he was recovering, but symptoms, evincing the existence of some fluid in the cavity of the chest, made their appearance—he went into the country, and soon after his return to town he died. On examination it was found, that a coagulum had formed in the cavity of the pleura, and it was supposed that this coagulum, not becoming vascular, acted as an extraneous body, and produced inflammation and its ultimate consequences. This being the case, we should be on our guard in giving our prognosis of the safety or danger of these patients.

WOUNDS OF THE PERICARDIUM AND HEART.

These wounds are but rarely seen in practice. Some time ago, a soldier on duty had a bayonet plunged into the right auricle, and what is surprising, the man lived forty-eight hours after the accident. On examination it was found, that a coagulum had formed, and completely filled up the wound; but on the man's first going to stool, a second hæmorrhage took place, and he was found dead, sitting on the chair. The late Mr. Saunders saw a case where the man, who was the subject of this accident, received a stroke with a sickle upon the chest, between the sixth and seventh rib, rather nearer the sternum than the nipple; the man in the first instance did not appear to suffer much from the wound, and it was closed and went on well—but in a short time symptoms of hydrops pericardium came on, and he died. On examination after death, a clot was found in the pericardium, which was alone wounded, and the whole internal surface of this membrane was inflamed.—Wounds of the heart always prove fatal, and it is generally supposed immediately, but this is not uniformly the case. Patients have lived under these circumstances several hours, but the wounds of course have been but small. If the heart have been ruptured it is impossible to preserve life, even a few minutes: this accident sometimes happens in old age, absorption of the substance of this organ taking place near the coronary valves: King George the Second died from this cause.

Wounds of the aorta and vena cava prove more suddenly fatal than those injuring the heart.

WOUNDS OF THE THROAT.

These wounds require in their treatment a great deal of anatomical knowledge, as well as prompt decision. Considering the distance from the chin to the sternum as nine inches, when the chin is extended, we are led to class wounds happening to those parts into three kinds. In the first three inches from the chin, downwards, may be comprised almost all those wounds occasioned by persons attempting self-destruction: it is seldom that the œsophagus is wounded here, and for one case where such an accident happens may be seen thirty cases of wounds of the pharynx. Wounds above the os hyöides penetrate into the mouth. The incision made by persons attempting to destroy themselves is generally too high up to wound the carotid arteries. The most frequent vessels divided in wounds of the throat are the branches of the external carotid—the external maxillary, the lingual, and thyroideal, and it will be necessary to secure these. When the main trunk, the carotid, is divided, it must be secured as recommended on the subject of wounds of arteries, and the simplest plan is that of Mr. Abernethy, when there will be no danger of wounding the internal jugular vein, or the par vagum. The treatment is to bring the chin as much as possible to the chest, in order to secure the edges of the wound perfectly together, and the head should be retained in this position by bandages properly adapted: the wound should be brought into as narrow a compass as can be done, by sutures and adhesive plaster.

Wounds of the second kind may include three inches, the upper part of the larynx, the cricoid and thyroid cartilages; the wound seldom goes beyond the posterior part of the trachea, or injures the œsophagus—in this case the air escapes from the wound, but fluids may be swallowed without their passing through it. If the thyroid cartilage be divided to any great extent, a suture is to be passed through the pericondrium, bringing the edges into contact. It sometimes happens, that several cuts are made, and the cartilages are divided in more places than one: here attempts must still be made to unite them by the adhesive process, though in these cases the cartilages have been known to exfoliate. It is better to use sutures in every description of wounds in the throat. When a wound happens between the thyroid cartilage and the os hyöides it is attended with great danger, and it was formerly deemed invariably fatal; but a case occurred to Mr. Astley Cooper, which proved that this was erroneous: the death of the patient is occasioned by the fluids and food taken into the mouth making their way into the larynx, on account of the separation of the epiglottis from the trachea—it would be advisable, to prevent this happening, to convey nourishment into the stomach by means of a tube introduced into the passage to the œsophagus.

The third species of wound takes place in those parts between the sternum and three inches up the trachea: this will include, on the fore part, the trachea; on the back part, the œsophagus; and on the lateral parts, the carotid arteries. A wound of the trachea is not of itself mortal. If the œsophagus be wounded with the carotid artery, it must be done by a sharp instrument of a pointed kind. A transverse wound, by which this tube is injured, must inevitably include the arteries. Wounds of the trachea alone are easily known by the cartilages separating from each other, and by the air rushing out in the act of expiration.

The treatment is to make use of three sutures through the pericondrium, one anteriorly and two latterly; it is rarely an instance is seen of the œsophagus being wounded; these latter wounds are fatal either from the fluids taken in, passing through into the cellular membrane, and thus producing violent inflammation, or when the œsophagus is healing, a contraction of its diameter being the result, and the patient is starved to death. Bougies might be used with advantage if introduced previous to the contraction extending to any considerable degree. The only fair chance we give patients thus wounded is by introducing a long tube into the œsophagus, and administering the requisite nourishment through it: in other respects it should be attempted to heal the wound by the adhesive process. When the carotid artery, or internal jugular vein is divided, the patients mostly die before any professional assistance can be rendered.

Mr. Astley Cooper has clearly demonstrated on the human subject the practicability of securing this artery without any great and immediate derangement in the functions of the brain; and it would be advisable in this instance to secure the internal jugular vein by ligature, as pressure alone cannot be trusted to; and the danger we run by applying a ligature would be infinitely less than the hemorrhage that would ensue, from neglecting its adoption. The most troublesome occurrence we meet with is a convulsive cough, which greatly distresses the patient, and to relieve it, opium, given in mucilage of gum-arabic, will be proper. The sutures in none of these cases should penetrate through the lining of the trachea or larynx, otherwise the irritation will be materially aggravated. The larynx is found to be more sensible of irritation than the continuance of the tube, the trachea. There is generally great hoarseness and weakness, and occasionally complete loss of the voice, from division of the nerves. Bleeding must be had recourse to, to mitigate the severity of inflammation, and the antiphlogistic plan strictly adhered to. The patients should be kept as quiet as possible.

WOUNDS OF THE JOINTS.

Wounds made into the cavities of large joints are the most dangerous of those affecting the body almost in any instance, on account of a very large surface becoming exposed, though the external wound be very small. If union do not take place by adhesion, inflammation to an alarming extent, and consequent suppuration, almost uniformly ensue, from the nature of the parts composing a joint: for it is not only the great extent of surface that becomes exposed to inflammation for the purpose of uniting, but the inner parts of a joint when inflamed are incapable of readily uniting by the adhesive, and mostly proceed to the suppurative process: and this goes on until the extremities of the bones exfoliate and granulations arise from their surface. This being the case the most violent symptoms arise subsequent to a wound of a joint. When a wound is first inflicted, the synovia escapes, and this circumstance is the criterion by which we judge whether the instrument has entered the cavity: if the lips of the wound are neatly and carefully brought together, and they adhere, no further extension of the mischief is to be apprehended; but if allowed to be left open, the discharge of the lubricating fluid will prevent union, and inflammation will most certainly ensue upon the whole internal surface, and a great quantity of matter will be formed which does not discharge itself directly out of the joint, but burrows itself both above and below the wound, and several openings are frequently formed for the evacuation of the pus: the constitutional irritation will be extreme, and if the patient be not very strong, it will be necessary to amputate the limb; but if his stamina be good, the patient may probably escape with anchylosis.

Treatment. It is required, in the first instance, to bring the edges of the wound together with adhesive plaster, and if this cannot be readily done, sutures may be employed, though with great caution, lest the capsular ligament should be included: for if this occur, unfavourable symptoms will arise. In the last case seen, although suppuration had commenced, the joint did not suffer materially, for the opening was closed up with the adhesive plaster, and the inflammation in the joint being very great, a saturnine poultice was applied all over the knee: under the plaster a portion of coagulable lymph formed, and which was, perhaps, rendered more firm by the action of the lead. Union by this means was effected, and the fluid effused in the cavity of the joint was ultimately absorbed; so that even when inflammation has come on, it is better to attempt union by adhesion. In cases of this kind we are to depend much upon opium, and this may be given in as large quantities as the constitution will bear without injury. Other topical means, besides the poultice, may be used, as leeches, &c.; and the antiphlogistic regimen must be here persevered in.

When granulations have taken place in a joint, anchylosis will ensue, and it will be found to be of three kinds: First, when there are granulations between the ends of the bones and where the ligament is attached, adhesive matter is thrown out, (but is to be considered a very rare occurrence) which becomes vascular; for when inflammation has taken place, it seldom ceases before exfoliation ensues. Under the preceding circumstances a little motion of the joint will be preserved, but if the cartilage covering the ends of the bones be absorbed, then bony matter is thrown out, and motion completely destroyed.

Second kind, is that which arises from the bone being altered in its shape at the diseased ends, by little spiculæ of bone arising from the extremities, and thus motion is prevented: but by passive motion of the limb, united by friction, we can produce absorption of these, and restore in some degree the motion of the joint. The third kind is that in which anchylosis is formed by bony granulation, and the joint becomes fixed.

WOUNDS OF THE BRAIN.

The brain is every where surrounded with bone, therefore well defended from injuries. Sometimes, however, the bones are fractured, and a portion of the brain removed either by sharp instruments entering the skull, or by pieces of depressed bone. It may be supposed that these wounds would be immediately fatal, but they often do not affect the powers of the mind or body, and are dangerous only from inflammation supervening, and the shooting out of fungus. A man had a portion of the os frontis driven in on the cerebrum; part of the brain escaped from the wound, to the quantity of a tea-spoonful, with the pia mater on it; the wound healed without any bad symptoms, and the depression remained without any serious consequences arising from it. A boy likewise received a blow from a boat hook, which drove the right parietal bone in upon the brain: the brain was seen pulsating with a hole in it; he had a slight hemiplegia of the left side, the wound healed without any untoward symptoms, and the paralytic parts recovered their usual powers.

Whenever a depression takes place, if the displaced bone be removed, no disagreeable symptoms ensue; it is inflammation alone that occasions the death of the patient; when this is feared, large quantities of blood may be taken: after the inflammatory stage, a fungus shoots out from the brain; this is found to be the substance of the brain, granulating in a luxuriant state; as much as three or four ounces has been seen to be discharged this way: if, however, it continue any time, hemiplegia ensues, and the patient dies. If the wound be not very large, a piece of the fungus may be cut off even with the bone, then a piece of dry lint should be placed on it, and constant pressure kept up by a bandage; this treatment has often succeeded. Granulations from the dura mater shoot over the fungus and form a cicatrix.

LECTURE XI.

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ON GUN-SHOT WOUNDS.

Any substance that enters the body with a degree of velocity occasions the same consequence as a gun-shot wound, as from the blowing up of a rock, &c. These wounds differ from incised in this, that from the contusion received, they most commonly terminate in a sinus; they are of two kinds, that in which the ball has passed through, and that when it still remains lodged in the body. When a surgeon is called to an accident of this nature, from the smallness of the aperture he is led to doubt the possibility of a ball having entered the body: but this appearance depends upon its being received either point blank, or in a slanting direction, also on the size of the ball: it, however, generally enters at right angles. The wound has a black aspect around its edges, like an eschar produced by a caustic. In the course of a few hours inflammation supervenes to a much greater degree than that following an incised wound; this is shewn by the swelling not being confined to the part, but supposing the leg to be wounded, extending along from the knee even to the thigh.

The first discharge of the wound is of a jelly-like appearance, being composed of coagulable lymph. This has been known to have been removed from day to day by an experienced French surgeon, who was not aware that he was counteracting Nature's first efforts towards a cure. This lymph adheres, and is now and then vascular. After continuing four or five days, a slow and gradual process of suppuration comes on, which is not complete until from the 10th to the 14th day; so that this takes a much longer time than in an incised wound, especially if any tendinous structure have been injured. The eschar must necessarily separate before suppuration is complete, which accounts for the slowness of this last process.

If a ball have passed out opposite to where it entered, it is to be treated as a contused wound; very little hæmorrhage commonly comes on, as will be hereafter explained. Hunter considered these wounds to differ in no respect from those of contusion; and the same treatment will be applicable. The best application will be, a poultice of bread and milk to the wound and evaporating lotion to the leg, as soon as the skin becomes inflamed. The reason for applying thus early a poultice is, that it is an object to bring about a separation as soon as possible. After a few hours, and prior to any danger that may arise from a second hæmorrhage, poultices and fomentations are advantageous, from their diminishing inflammation; we may also do good by topical blood-letting, as leeches, which are easily procured in this city, but not so on actual service in the army. This would induce me to take notice of the practice of a surgeon in the army on foreign service, who had a number of gun-shot wounds under his care: it was freely to dilate the wound, and suffer it to slough, with a view of affording an opportunity for the discharge of any irritating body. Now this indiscriminate dilatation Hunter decidedly objected to: and it is evident that the only way in which it can do good, is by unloading the vessels, and for this purpose scarifying the part will answer every purpose, and is one of the best means to be made use of when the limb becomes extensively inflamed and swollen. By its adoption, united with the above means, the appearances have been found to subside the following day or two; and another good effect scarifying has, is that the eschars separate more quickly.

It is but fair to mention there are numerous instances of the success of dilating wounds: this practice was adopted in many cases that occurred in the engagement between the Swiss and Parisians on the 10th of August, 1792. A practice that gives ease, and tends to check inflammation, is wrapping the whole limb in cloths wet with the liquor. acet. plumb. dil. especially in warm weather. As to the constitutional treatment, large doses of opium with antimonials will be found beneficial when the patient becomes restless. Bleeding, if the powers of the constitution are not good, and the contusion extensive, will be improper; but in general it will be right to bleed plentifully, and if after the first bleeding the pulse becomes full, a second bleeding may be resorted to, especially if the wound be near any vital organ. It should, however, not be carried to any imprudent excess, as tetanus is a likely consequence of these wounds, and the great weakness induced would render the living powers unfit to sustain the discharge from wounds of this nature. The Peruvian bark is of great advantage to be judiciously administered. We should purge sparingly, as it is often difficult to check it.

Anxious to ascertain whether a person suffered much pain or not at the time of receiving a gun-shot wound, numerous inquiries have been made, from which I have learnt, that unless the ball struck against a bone, the person was not in the least sensible of his having received an injury; but if a bone were struck, the sensation of a strong shock was communicated to every part of the body; and this was seen to be the case in a duel fought by a Captain Lewis: he was severely wounded in the legs, and fell as if he had been struck by a forge hammer.

Having got rid of the inflammation by the adoption of the means recommended, and given due support to our patient by rather a liberal and generous diet, combined with tonics, the healing of the sinus will be our next endeavour; and this sometimes takes a long time, from the inability of stimulating the centre of the wound. Under these cases it is proper to introduce a little of the hydrarg. muriat. dissolved in water, the tinctura lyttæ, &c., so as to excite healthy granulations; or a bougie smeared with the hydrarg. nitr. rubr., so as to stimulate the inner surface of the sinus. Some advise setons, but they do more harm than good, by laying the foundation of an abscess. If, notwithstanding these means, we do not yet succeed, and the sinus remains of considerable depth, the best plan will be to make an opening into the middle of it, so as to form two cavities, whereby union will be effected.

In cases where the ball is lodged in the body, a greater degree of consideration is required, and one might naturally infer, that the first step to be taken would be the extraction of it, or, in fact, of any extraneous body that might have been introduced, as pieces of iron, splinters of wood, &c. This practice will be perfectly right when it can be easily felt, and there is no danger of wounding any vessels. If it have passed with great velocity, so as not to be near the wound, nor yet to be felt on the opposite side, supposing it to be in parts not essential to life, the best method is to introduce a flexible metallic bougie, which yielding easily to pressure, acquaints the surgeon with the extent of the wound, without at the same time incurring any risk. Another instrument advised for this purpose, is the elastic gum bougie. The common silver probe is extremely improper. When, however, the ball is lodged in the cavity of the chest or abdomen, it is an unwise step to attempt any thing of this kind, as it will in all probability add to the danger. There are several reasons why it is frequently wrong to search after the ball; one is, that it sometimes becomes encysted in coagulable lymph, and remains so for life, being enveloped by a substance which prevents its acting any longer as an extraneous body, except it be in the vicinity of a large nerve. Another reason is, that Nature frequently forms an outlet for the ball in the production of an abscess; and the best and principal one is, that from the tortuous and indirect line which the ball is liable to take, it is rendered almost impossible to attempt any thing of the kind with a prospect of success. Several cases have been known where Nature has formed an opening for the passage of a ball at some distance from the part it entered, two of which will be sufficient for the present purpose.—Case I. A boy who had been guilty of robbing his master, determined to put a period to his existence, and for that purpose loaded a musket and fixed the muzzle opposite the scrobiculis cordis, which he supposed to be opposite the heart: the ball had entered at the scrobiculis cordis; his shirt caught fire, and he was a good deal burnt. Some opening medicine was directed him, but no blood came away by stool, which was much in his favour. On examining again four days after, a red line was discovered on the skin, extending some way, and on carefully passing the finger along that part, the ball was found lodged above two inches from the spine, having passed through the rib. Case II. A young lad was accidentally shot at Walworth by some volunteers while firing at a target. It appeared as if the ball had passed under the scapula. In about nine months he felt a kind of knob in the arm; and on feeling it, no doubt could be entertained that it was the ball which had worked its way thence. A long incision was made near the deltoid muscle, and it was extracted. From these cases it will then appear, that if a ball can be easily taken out, it should be done; but if not, it is better to allow it to take its course, as Nature is found very kind in her operations; and *lead* causes less irritation than any other substance in the body.

An ARTERY divided by a gun-shot wound does not bleed as in other injuries, and the reason is, that a fringe of cellular membrane is formed at its end, and within this a coagulum forms, whereby the hæmorrhage is stopped; but though there is no immediate danger, yet a distant one may be apprehended, so that it would be extremely unwise in a surgeon to state with confidence his opinion that no bleeding will come on, although the wound be ever so slight. An officer, who had been shot through the leg, appeared to be doing so well as to be directed by his surgeon to walk about, and without the tourniquet, and from the increased exertion hæmorrhage came on, which proved fatal before any one could assist him. In case an artery is wounded and a ligature is necessary, remember to put it on much farther up than you would in other divisions, or you will not prevent subsequent bleeding during the sloughing process. Although a small artery will not bleed so readily as when divided with a knife, yet an hæmorrhage may occur sufficient to destroy life; if the artery be partially divided, it bleeds as freely as if made in any other way. It is on the separation of the eschar that a secondary hæmorrhage is to be apprehended, and although they may not have been originally divided, yet they may suffer so much contusion and violence as to slough with other parts. The eschar may not affect the whole of the coats of an artery, but they become weakened and give way at its separation. When a ligature is made it should be passed at least an inch above the wound, so as to allow space for the sloughing process. The division of a vein sometimes requires surgical assistance; here it will be necessary to tie it above the wound. As this, however, cannot be done to the auxiliary vein, a piece of lint may be introduced to compress it. It will be advisable when a gun-shot has passed near an artery, to apply a tourniquet loosely on the leg, so as to be immediately applied if necessary. Gun-shot wounds of the chest are common, though wounds of the lungs do not so frequently happen; for the chest, being surrounded with bone, presents a firm resistance to a bullet, which enters the skin and becomes turned off, following the course of the ribs without penetrating the chest.

The first symptom of a wounded lung, is coughing with bloody expectoration, difficulty of breathing, and the patient always lies on the wounded side, great pain, small, contracted, irregular pulse, pallid countenance and cold extremities, with emphysema on the external surface of the chest: the blood that is brought up is mixed with a quantity of air, which makes it appear frothy. Hunter considered the wounds less fatal than when made with a cutting instrument; and this in all probability may be attributable to their bleeding less, and consequently the danger of extravasation is diminished. Wounds of the lungs are not always fatal. A farmer in a rencounter with some smugglers, received a ball which pierced his scapula, and came out at the nipple, and he recovered. M. Sabatier relates a case of an officer wounded in the chest: the ball entered where the cartilage and bone of the seventh rib unite, and in coming out at the angle of this bone, fractured it in two places; the splinters of bone were removed, and a piece of his coat; several splinters were afterwards in the progress of the treatment extracted, and one from the substance of the lungs. In thirty days he was bled exactly thirty times, and although he had to contend against the irritation of the splinters, the introduction of a seton, &c., he recovered. A bullet may lodge in the lungs without being attended with fatal consequences. In the dissection of a man, a bullet was found in the lung, a cyst had been formed round it, and he had suffered no inconvenience from it during life. I have remarked that gun-shot wounds are less dangerous than those from a bayonet, or a similar instrument, owing to the hæmorrhage being less from one than the other. When patients die of these wounds, it is from their not healing by adhesion; but after the inflammatory stage, suppuration ensues, which exhausts them. Although it is well known that a ball may pass through the lungs, and a recovery take place, yet it is stated by a gentleman of considerable experience as an army surgeon, that phthisis pulmonalis most frequently comes on. Morgagni mentions an instance of a ball being found encysted in the lungs, but he did not know any thing of the history of the case as it happened in the course of dissection. Wounds of the chest are often confounded, or rather complicated with those of the abdomen; that is, a ball enters the chest and pierces the abdominal viscera: one instance of this has been seen; they are uniformly fatal.

The treatment of gun-shot wounds in the lungs, will be precisely with the same intentions as those of more simple wounds. Copious bleedings in the beginning; they relieve the patient, and lessen the danger of hæmorrhage. and also inflammation. If the inflammatory symptoms run high, they must be repeated at the discretion of the surgeon. Opium, to keep the patient quiet, should be freely given; it diminishes the irritability and cough. Every thing taken should be cool; low regimen and perfect quiet observed. Dry lint may be laid on the surface of the wound, so as to check the discharge, which occasions an extravasation in the cavity of the thorax. When extravasation has taken place, an incision should be made into the chest, thus: the patient must be laid in a recumbent posture, leaning rather to the affected side. The integuments are to be drawn up with one hand, so that when replaced in their original situation, the opening in them may not be opposed to that made underneath through the intercostal muscle and pleura. An incision is to be made between two of the ribs through the integuments: at whatever point is fixed on, it must be made near to the superior edge of the lowermost rib of the two, so as to avoid the intercostal artery, which runs on the lower edge of each rib. The muscle is to be divided and the pleura exposed, into which a small opening is to be made, a canula introduced, and by the patient's inclining more on this side, the matter evacuated; the wound must be healed by adhesion. The usual place, either for hydro-thorax or when matter is collected, is between the sixth and seventh rib, midway between the sternum and spine.

In gun-shot wounds tents were formerly introduced, but they are very improper, and now universally abandoned, as they act as extraneous bodies, and aggravate the mischief. Experiments have been made of throwing quicksilver into the lungs, from which we know that extraneous bodies may remain there sometimes without producing fatal effects.

Gun-shot wounds of the heart are immediately fatal, in most instances; but Mr. Astley Cooper had a case sent him from Mr. Furze, a surgeon, at Plymouth, in which it did not happen so.—Case. A soldier was wounded at Corunna, the ball it was found had entered the chest, but there were no particular symptoms, except high inflammation: he survived fifteen days after the accident, and was then examined. It was found that the left side of the thorax contained two quarts of sanious fluid, and the pericardium considerably thickened: the ball was found lodged in the right auricle, having passed through the root of the ventricle at the root of the tricuspid valve. This may at first sight appear extraordinary, and one thing is certainly so, and which I am at a loss to account for, viz. that the effusion of blood did not produce death sooner.

GUN-SHOT WOUNDS OF THE ABDOMEN.

These are for the most part fatal. In the case of a wound in the stomach, inflicted on a gentleman, he only survived forty-eight hours. In another, where the intestine was the subject of injury, in the instance of Mr Blight, who was murdered by Patch some years ago, the former only lived seventeen hours: the intestine was inverted, and presented a rose appearance. A slanting or indirect wound of the abdomen is now and then recovered from, of which a case occurred at Haslar Hospital; the ball had pierced the peritoneum and portion of the intestine in contact—granulations formed, and he did well. There is another species of wounded intestine, which has been known to be recovered from.—Case. Captain Hanley, of the 3d regiment of Foot Guards, at the battle of Aboukir, under the gallant Nelson, received a shot through the pelvis, on one side, and it came out on the outer side of the femoral artery, and fell into his pantaloons. The ball weighed upwards of three ounces: a glyster was thrown up a short time after, but the rectum being wounded, it came through the wound; the latter however soon closed; he recovered, and was some time ago in good health: the wound took place below the reflected portion of peritoneum. Wounds of the abdomen are rare in comparison to those of the chest, and this proceeds from the direction troops are taught to fire being more elevated. Those who have had opportunities when abroad, after engagements, of seeing a vast number of gun-shot wounds, have assured me, that not one of them was in the abdomen, but a great many in the chest. When the small intestines are wounded no fæces are discharged; there is a feeble quick pulse, dejected countenance, vomiting, with extreme pain and tension in the abdomen: if the large intestines are wounded, it is known by the stools being bloody, and the fæces are discharged at the wound as well as at the rectum; these latter are not so dangerous as wounds of the small; in some cases the same treatment will be advisable as in mortified strangulated hernia, when reduced, if the wound be confined to one only. Copious bleedings are proper, fomentations, &c. to produce separation—no cathartics are to be given—such diet should be allowed as produces little or no fever, and milk for this purpose will answer best.

GUN-SHOT WOUNDS OF THE BRAIN.

Injuries of the skull or cranium, from this cause, are to be treated the same as produced from any other: if there be a depression of the bone, with a corresponding wound in the brain, you are to remove the depressed portion of bone, &c. Symptoms of compression seldom come on, granulations or adhesions take place, and the patient recovers. There is, however, a greater degree of danger from a gun-shot wound of this kind than from a common accident, for in it there is an eschar to separate, which is an increased process of danger: but if the bone be depressed, it should be raised as if proceeding from any other accident. Examples have been seen often of balls lodging in the head, without any inconvenience; and from these taking a direction as if they had entered the brain, they have generally been supposed to have lodged in the skull, but on dissection they have commonly been found in the ethmoid, sphœnoid, or frontal sinuses. A case occurred where, from the bursting of a gun, part of the breech entered the os frontis, the inner diploé of which was broken, and the pulsatory motion of the brain observed: after a time a suppuration took place, the piece of iron was discharged, and the patient recovered. In this case it must have been lodged in the frontal, and perhaps part of the sphœnoidal sinus, and this without producing pressure on the brain. In another case, where a nobleman attempted to destroy himself by firing a pistol a little anterior to the ear, he recovered from the immediate symptoms, and after two years a discharge took place in the nostril, and continued some time; ulceration then came on in the roof of the mouth, the palatine artery was divided by the process, and in restraining the hæmorrhage the ball was felt, which afterwards was discharged through the palatine portion of the superior maxillary bone. A ball may be lodged in the brain without any fatal symptoms or mischief ensuing: it first occasions coma, but soon goes off. Desault mentions a case of it in his memoirs. A case was seen at Guernsey, of a ball lodging for a length of time in the ethmoid cells. And among other surprising cases of these wounds, was seen that of a man who had the ramrod of a pistol pass into his forehead and out at the occiput, without death ensuing.

ON COMPOUND FRACTURES OCCASIONED BY GUN-SHOT WOUNDS.

A compound fracture by a ball is the worst kind of fracture that we have to treat, because the bone is broken into a number of pieces, besides the laceration of the integuments, which will be disposed to slough. When bones are much splintered, *an incision* should be made, and every small particle with the greatest care removed—the two extremities are then to be brought into contact, and will unite, though the limb may be shortened.

This injury, of all others, requires *dilatation*, as the *incision* will prevent the formation of an abscess:—by this method being accurately pursued, the amputation of the limb might be prevented. If a ball wound a small joint the patient will generally die from extent of inflammation, and if the bone be splintered there is no chance of saving the limb: in the knee or ankle there need be no hesitation in operating. It was tried with success to save the limb, when the elbow joint was splintered in the hospital at Toulon. If the person be intoxicated during such an accident, and the operation be performed immediately in this state, there is little chance of recovery; Dr. Babington mentions, that out of twenty-four operations on board of ship, during the last war, only two recovered thus situated. It would therefore be right, if possible, to wait till the patient got over the inflammatory and the commencement of the suppurative stage, which may be done in every injury but that of the knee joint and ankle, where it would be right to amputate immediately. Amputation performed in health is similar to removing a branch of a tree in summer, when it is in full foliage; it affects the health of the tree much more than when removed in winter; so in man an operation will succeed infinitely better when the constitution has been gradually brought from a plethoric to a lower state. This treatment refers only to the lower extremities. Operations on the upper are not so fatal. A wound in the arm may require immediate amputation, and the patient will generally do well: the larger the part removed the greater the danger, *i. e.* amputation above the knee is more dangerous than below it.

After the battle of Fontenay, the Royal Academy of Surgery, in 1756, adjudged to Faure the prize in cases of gun-shot wounds, where amputation was necessary, for assigning when was the most proper time to operate. Faure tells us, that after this battle, out of three hundred amputations thirty only were followed with success. His plan was to *delay* its performance *till the first effects had subsided from the injury*. Our celebrated countryman, Hunter, coincided in this opinion,—we must either operate previous to the inflammatory symptoms, or wait till after the suppurative process has commenced; these are the only two periods at which it would be prudent to adopt such an operation,—and I think the inference is clear, that if a limb *cannot* be preserved, the sooner the better it is adopted: why suffer the patient to run the risk of sinking from the effects of the injury? The violent commotion in the system attendant on the attempts at its restoration must be great, the constitutional suffering excessive, the dangers of mortification and death staring us in the face;—by its speedy adoption we convert an extensive contused wound, with fracture, into a simple incised one, and I should consider it a wilful neglect on the part of the surgeon if he hesitated.

The celebrated D. J. Larrey has written a valuable work, in three octavo volumes, wherein this subject is introduced, and this long debated question, in my opinion, very satisfactorily decided,—that operating before the appearance of the primary symptoms is by far the most safe and successful; and although Faure was supported by so great an authority as John Hunter, I trust none will be found so illiberal as to be obstinately destitute of conviction of error. D. J. Larrey, by his speedy operating, saved three-fourths of his patients, of which several had lost two limbs.

On primitive amputation he says, "when a limb, which has received a gun-shot wound, cannot be preserved, it must be amputated immediately; the first twenty-four hours are the only hours of calm which nature enjoys. Secondly, the danger of a long continuance in the hospitals is less, by converting it into a wound capable of a speedy cure. Thirdly, when the patients are obliged to be abandoned, and the operation is performed, the dressings may remain several days on with benefit to them." D. J. Larrey enumerates eight cases, in which immediate amputation will be necessary. First, a limb carried away by a shot, splinter, or shell. Secondly, when a body propelled by gunpowder strikes a limb, in such a manner that the bones are crushed, the soft parts greatly contused, lacerated, and carried away to some depth. Thirdly, if the same body should carry away a great portion of the soft parts, and the principal vessels of a limb, as the thigh, for instance, without fracturing the bone. Fourthly, if a grape-shot of a large size strikes the thick part of a limb, crushes the bone, cuts and lacerates the muscles, and destroys the great nerves, leaving the principal artery unhurt. Fifthly, if a spent ball, leaping along the ground, should strike obliquely a limb, without producing any solution of continuity in the skin, as often happens, the parts which make resistance to its action, such as the bones, muscles, tendons, aponeuroses, and vessels, may be ruptured and torn.—Note. Should, on a careful examination, the vessels and bone be spared, and the muscles are the only parts injured, amputation will not be necessary; and although M. Lamartiniere and D. J. Larrey recommend an incision, to give exit to the effused blood, it should not, in the author's opinion, be adopted unless the extravasation was very considerable. Sixthly, when a piece of a shell, a splinter, or a ball has fractured the articular extremities, especially those forming the joint of the foot or knee, and the ligaments have been ruptured or lacerated,—or if a foreign body were lodged in the thick part of the articular extremities, or wedged in the joint. Seventhly, if a large grape shot, a small cannon ball, or a piece of shell, have denuded, in passing through the thick part of a limb, a great surface of bone, without fracturing it. And, eighthly, when one of the great articulating joints, as the elbow, has been laid open to a great extent, by a cutting weapon, and an effusion of blood into the joint.

Faure considered that the operation performed from the fifteenth to the twentieth day appeared less dangerous than at the first instant, by which time he thought the commotion produced by the violence dissipated. Experience has now fully demonstrated the impropriety of Faure's practice. It is the primitive symptoms that are to be most feared in gun-shot wounds: of those who suffered immediate amputation, in the naval service, after the battle on the 1st of June, 1794, very few died;—out of sixty carried to the Naval Hospital at Brest, only two died of tetanus, although several had both arms amputated, the rest were cured. D. J. Larrey observes, on consecutive amputation, that extensive mortification, where nature has traced out its limits, convulsions of the wounded limb, diseased or excessive suppuration, and bad unhealthy state of the stump, may require its performance.

I have already remarked, that incisions for the extraction of foreign bodies, as wadding, pieces of linen, &c. as well as to remove splinters of fractured bones, are required;—they produce more mischief than a bullet, for being in pieces, they cause a number of small abscesses; large substances may remain without however exciting inflammation: a piece of iron was lodged between the flexor tendons of the thigh; it was so near the intercostal artery that an incision could not safely be made;—it remained without any mischief, only interrupting the action of the muscles. When a ball excites inflammation it will come out with the pus. When a ball can be found, it may be removed with a slender pair of forceps. When abscesses form, from the entrance of any extraneous bodies, a large opening should be made for their discharge. Wounds from small balls are not often dangerous; they will sometimes remain in the body, and at other times work out of themselves. When amputation is requisite in common accidents, it is especially so in gun-shot wounds ;—the bones are more splintered, and the wound much more contused; we find exceptions to every general rule that could be laid down. Dr. Babington had a case of compound fracture of the knee, from a gun-shot, in which the patient recovered; but I mention this, however, more as an extraordinary case than for imitation; although fortunate, the practice was decidedly wrong. The treatment must be assisted by rollers and proper bandages, as the eighteen-tailed bandages, pads, and splints, &c. Never use any oily or unctuous dressings, as some authors have recommended.

Burns, proceeding from gunpowder, appear alarming to those who are unaccustomed to see them, from their black appearance. Cloths wet with the liquor. acet. plumb. dil. should be applied; all oily substances should be avoided, as being improper; they induce ulceration: the blackness generally remains: care should be taken to prevent sound parts from coming into contact with the burned, which might give rise to an union between them. A case was seen where the fore arm, from being kept too much bent, had adhered to the upper: when these burns are deep they occasion much fever. A man in Guy's Hospital died from the inflammatory symptoms that ensued after a burn. Poultices, to moderate these symptoms, are the best applications in all deep burns.

LECTURE XII.

ON POISONS.

A **POISON** may be defined to be any substance which, however minute and small, is capable of producing deleterious effects upon the animal machine. It originates from four different sources, and may therefore be divided into as many different kinds: viz. animal, vegetable, mineral, and morbid, and with respect to the last, it is necessary to distinguish between those occasioned by the human and the brute creation; some add a fifth, viz. gaseous. Animal poisons are the stings of various insects, reptiles, rabid animals, &c. Vegetable, such as opium, cicutæ, hyoscyamus, aconite, &c. Mineral, as arsenic, sublimate, (the muriate of mercury), lead, zinc, &c. Morbid are numerous, as small-pox, measles, plague, venereal virus, marsh miasmata, angina, scarlatina, vaccine virus, hooping-cough, itch, &c. Some of these morbid poisons act locally, as itch, hooping-cough, and syphilis, but the most are constitutional. The itch appears in three days. Syphilis from the third to the seventh day. It will be found, in tracing the action of poisons, that they operate in three ways—first, upon the nervous system, exciting considerable irritation; the sedative effect is rather doubtful: others act on the blood-vessels, producing inflammation, which destroys the life of the part, as arsenic: and there are some which act in both ways. It appears that opium does this,—it inflames the coats of the stomach, and also affects the nervous system, so as to bring on convulsions. Zinc, as a mineral poison, almost immediately acts, which is not the case with respect to morbid poisons. Most of the latter, however, have a particular rate: as, for instance, the small-pox, which in the natural way appears about the fourteenth, but the inoculated on the eighth or ninth day. A variation will be observed according to the disposition of the constitution, but this will hold good as a general rule: so also with respect to the vaccine. As to scarlatina it commonly happens on the seventh or eighth day, though I have known it protracted to the seventeenth or even to the twenty-first. Rubeola on the ninth day after infection is received.

To make myself better understood; from the time the constitution becomes indisposed the small-pox eruption appears from the third to the fifth day; that of rubeola on the fourth or fifth day; and scarlatina anginosa between the second and fourth day inclusively. Some act by abrasion of the surface, as in measles; affecting the cuticle of the eye or trachea. Many are absorbed before they produce their effects, as the small-pox, &c.; it may be absorbed if taken into the stomach on bread, but is slower in producing its effects; the quantity of virus does not appear of consequence in producing the disease, and many are of opinion that the disease is milder if the matter be diluted. Some are extremely remote in their effects, and this is somewhat curious as respecting marsh miasmata, that though it produces ague in some very rapid and quick, yet in others it is found not to happen so.

Case.—A lady who had been absent at a watering-place with her family, about a month after her return was seized with an intermittent, some time afterwards her servant was confined with a similar disease, and the children successively: the impression had evidently been made while at the sea side, where the disease was prevalent. It has been also remarked, that a person who comes to London, from an aguish country, if ill at all, is affected with some intermittent complaint. But the poison that is the most gradual of any in its effects, is the saliva of a rabid animal.

Dr. Babington has recorded a case in the Medical Researches, of a gentleman who was seized with hydrophobia, in a day less than twelve months after the bite of a cat.

You will find that the action of vegetable and mineral poisons depends upon the quantity introduced into the system, as it is known when administering them in small doses, they act as remedies; but this will not hold good with regard to morbid poisons, as the minutest particle inserted will produce the original disease, which may be frequently seen in the small-pox. Dr. Fordyce, however, thought by dilution its powers were weakened, but I have not had sufficient proofs adduced to submit implicitly to this opinion, although it appears very rational. Some poisons require a susceptibility or predisposition in the constitution for their action: in the small-pox this is certain, though not so in syphilis: this is not readily explained, for though the predisposition be destroyed, yet we can trace no obvious explanatory cause. There are several examples on record of persons having had the small-pox twice; in general, however, the predisposition is lost by having the disease once:—hence we hear of some few solitary cases of the inefficacy of the cow-pock, as a preventive against variola; it may be attributed to a similar cause, and ought not, with justness and fairness, to militate against the general advantages we derive from so inestimable a discovery, which has immortalized the name of Jenner. By frequent repetition of lues venerea, the body gradually becomes less susceptible of it. Very few diseases can be inoculated. The small-pox, cow-pock, chicken-pox, measles, &c. may be produced thus, but some are not rendered milder by its adoption, as for instance, the measles.

A man was employed in the neighbourhood of Yarmouth to kill wasps, because he was never known to have felt the least inconvenience from their sting: some time after this happened he was met accidentally, and it occasioned some little surprise, to hear him say, that he had latterly suffered extremely from the sting of these insects; and, on inquiring the reason, discovered that he had been afflicted with an ague some time before, which had produced a total change in his constitution, and rendered him as susceptible as another person.

A case came under my own observation in the person of Mrs. Francis, who had been stung on the arm below the elbow by a wasp; her arm swelled up to the axilla, to an amazing size in the course of a short time. I attributed it to her extreme irritability; a strong poultice was applied to the wound, and cloths kept constantly wet applied around the arm, with the liquor. acet. plumb. dil. vinegar and water in equal quantities: and it was deemed necessary to bleed, purge, and give opium.

The sting of insects, in this country, seldom requires much attention; oil, opium, and volatile alkali, as the spir. ammon. succin., are the principal remedies;—some apply vinegar, lemon juice, spir. vin. camph. spir. corn. cer., &c.; others recommend employing only an alkali to neutralize the poison, extracting the sting by incision, &c.

The bite of a viper is productive of great inflammation, and constitutional irritation, with an appearance of ecchymosis, but is rarely fatal. The poison of these animals is found in capsules, or bags, at the root of two moveable fangs in the upper jaw: it is by compression of these bags that it escapes along the grooves in the fangs into the part bitten. A companion of mine, in attempting to kill a viper, was bitten; he immediately sucked the wound, but the part soon became painful, the arm considerably swollen, and attended with some degree of fever, and he lost the power of articulation; with respect to this circumstance, I cannot determine whether it arose from the tongue or arm, though it did not appear to be in consequence of the former, as it was not swollen. He ultimately recovered by the use of oil and poultices. There are several other instances: one case is recollected where the part was removed, but still the arm swelled a good deal, and it was some time before the patient recovered. This poison seems to operate chiefly on the nervous system. To see, in some measure, how it acts, a rabbit was taken and a viper bit its ear; after a short time was found a great determination of blood to the part, which soon became thickened, and the animal died. The whole surface of the cellular membrane appeared as if injected with venous blood, hence the tumefaction and livid spots which appear in these cases. Fontana attributes the danger in proportion to the size of the animal: in children it is more fatal than in adults. It seems also that the bite of a rattlesnake produces similar effects.

Treatment.

If the wound be inflicted on the finger or hand, a tight ligature is to be applied above the part, to arrest the progress of the fluid. Mr. Astley Cooper was led to adopt this plan, which it seems was countenanced by Fontana, from its having been practised on himself with success. Whilst lecturing on comparative anatomy, a viper accidentally bit him; a ligature was immediately applied by Mr. Fox above the wound: there was a slight ecchymosis the following day on the back of the hand, but no constitutional irritation. If it happens to a limb, a roller is to be put on, by which the operation of the poison is confined to the part, and absorption impeded. Excision is to be adopted in cases where this cannot effectually be employed, and your patient has fortitude to submit; or cauterizing the part with the kali purum, should he demur; or inserting the pulv. lyttæ in powder. Constitutionally the eau de luce is a great favourite, which some employ externally also. Olive oil has been equally celebrated, employed in the same manner, inwardly and outwardly. Dr. Mead advises emetics.

Mr. Ireland, Surgeon to the 4th Battalion of the 60th Regiment, formerly a pupil of Mr. Chevalier's, has inserted a very interesting account of the varieties of serpents in the West India Islands, in the second volume of the Medico-Chirurgical Transactions, and four cases which were cured by the administration of arsenic, originally noticed in Russell's History of Indian Serpents, from facts communicated by Mr. Duffin and Ramsay, of the efficacy of the celebrated Tanjore pill, in which this was a principal ingredient. Dr. Fowler's solution of arsenic was employed, containing one grain of arsenic in two drachms of liquid. ℞. liquor. arsenic. ʒij., tinct. opii. gtt. x. aq. menth. pip. ℥iss., this medicine to be given during the slight act of effervescence, which ʒss. of lime or lemon uice would occasion. The medicine was continued every half hour for eight times successively, using this liniment, ℞. ol. terebinth. liquor. ammon. āā. ℥ss., ol. olivar. ℥iss. When purging commenced the arsenical solution was discontinued, and a purgative glyster given twice. The lacerated edges of the wound were immediately removed.

ON HYDROPHOBIA.

A person bitten by a rabid animal is commonly affected about a month after the accident, but this varies very considerably in some cases, even so remote as eighteen or nineteen months; while others are affected so early as the eighteenth day. The first symptoms are a chilliness and indisposition to take food, attended with thirst, pyrexia, &c.; and on attempting to drink, the patient experiences the greatest horrors, though for some time he conceives the idea of swallowing a fluid without fear, but after repeated efforts is disappointed: he draws deep inspirations, and such anxiety is apparent in his countenance as even to excite pity in the mind of the spectator; his hand is at the same time convulsed, and the fluid spilt: after a time, in consequence of the spasmodic action of the muscles concerned in deglutition, he is equally incapable of digesting either solids or fluids. Ptyalism succeeds, and if any saliva happens to touch the patient, he experiences great uneasiness; just before death convulsions come on, so that in a few minutes he is in a state of epilepsy; but this only happens in young people, as adults are gradually exhausted by irritation. A person labouring under this disease has been ridiculously said to bark. I have never known an instance where the patient has attempted to bite others; he will, however, in case he knows what his complaint is, advise the by-standers to be aware; but this arises from impressions previously made on the mind. The cause of the disease appears to be excessive irritability, for any kind of stimulus is known to produce a degree of horror and shuddering. It is curious to see a patient go into the bath; before he sees it, it appears to affect his mind but little, but as soon as he comes near he suddenly starts back;

as, however, the resolution is seldom gone, he jumps in, but on touching the fluid convulsions are excited; the ruffling of the water is often enough to occasion these.

A very marked case of hydrophobia occurred at Guy's Hospital. The patient, a young healthy man, attributed the pain he felt in his right arm, hand, and shoulder, to rheumatism, being unconscious of the injury he had received; a gradual feeling of uneasiness, loss of appetite, oppression from wind in his stomach, and a sense of stricture in the œsophagus, succeeded to the pain in his arm. The symptoms which followed were those generally described: he lived only eleven hours after his admission into the hospital. His agitation was extreme, his countenance anxious: when spoken to his sentences were interrupted: his thirst was urgent, but the spasm brought on by deglutition gave him a dread of liquids. Under the effort to drink, two people with difficulty held him in his bed: his skin was cool and natural to the touch, but exquisitely sensible to the impression of air, even the breath of a by-stander: he complained of extreme heat, pulse intermitting; saliva viscid, and excreted with vehemence: latterly he swallowed easily. He vomited up much grumous matter, and was perfectly sensible within a short period of dissolution. In the ninth volume of the London Medical Journal, we find a similar case. Francis Stannier died in November, 1787, with every symptom of hydrophobia, although he was equally unconscious that it was occasioned by the bite of a rabid animal.

The wound occasioned by the bite heals very kindly, and apparently healthy, in the first instance; when the symptoms of hydrophobia come on, the cicatrix inflames, swells, and appears puffy, with a slight discharge. Two appearances present themselves on dissection. Inflammation of the pharynx, opposite the mouth, of the erysipelatous kind, and an inflammation of the stomach, yet not to that degree as to account for any particular symptoms: these are effects, not causes of the disease.

The saliva of a mad dog has been inoculated, but I never heard of its having taken effect, although Mr. Lawrence has related one case of this kind.

Treatment.

The first thing to be done is to ascertain, with a tent probe, to what depth the teeth of the animal have passed; then apply the kali purum, so as effectually to destroy the parts around the wound, beyond which we suppose the poison not to have insinuated itself; and as it would appear, from all the cases on record, that absorption is slow, and the constitution does not become immediately affected, but rather remotely, we may hope for success from its adoption, more particularly if done soon after the injury has been received. The lunar caustic may be also applied, and I have the authority of Mr. Cline for asserting, that in several cases which came under his care, it was amply sufficient: it must be used liberally. Many prefer extirpating the bitten part completely, and I see not the least objection to its adoption; and probably it would be preferable, less tedious, not so painful, and sooner healed; and I must confess, were a case to come under my own care, I should have no hesitation in removing the wounded part, even if situated among structures that would suffer by the necessary incision.

A young nobleman fell a victim to hydrophobia when caustic had been applied, but I attribute it principally to its not being effectually used, that is, so liberally as to cause a sloughing of the whole extent of the wound. With respect to medicine, all the celebrated specifics of different writers deserve only contempt; and it is only in those cases where probably hydrophobia would not, and where it did not make its appearance, that they have been so greatly extolled as preventives. Sea-bathing is of little service; though conformable to the opinions that are prevalent of its efficacy by the generality of mankind, it may be given a trial.

ON VEGETABLE POISONS.—All of these produce nearly the same effect: viz. giddiness, confusion of sight, wildness of the eyes, palpitations, stupor, vomitings, convulsions, &c. I have never known a person destroy himself with *cicuta*, though from its resemblance to the leaf of carrots, parsley, and other plants, it has often accidentally produced very distressing symptoms, and in some cases, I believe, a fatal termination.

When it occasions deleterious effects, it causes pain in the head, giddiness, loss of sight, convulsions, stupor, death. On dissection the stomach does not appear inflamed or altered, so that it can only be detected by its presence or smell. If injected into the arteries, it puts a stop to all motion of the body: applied to a limb, it destroys its sensibility. It has been much recommended in cancer, but it has seldom, if ever, been seen to effect a cure; it affords a temporary relief. In some scrophulous and venereal ulcers it relieves pain, and diminishes their irritability. I have successfully used it in acute rheumatism, combined with the antimonial powder. Its operation in an irritable bladder is doubtful.

I do not recollect *tobacco* taken by the mouth in sufficient quantity to prove fatal, but it now and then does by the bowels. If injected into the intestinal canal, it produces a very quick irregular pulse, universal paleness, cold sweats, great debility, and death. In hernia it has thus proved fatal, even ʒj. in ʒviij. aquæ: it quickens the pulse, but lessens its strength; it therefore is not a stimulant. As to its being injurious externally applied, the following case will sufficiently shew.—A child with tinea capitis, had the expressed juice of tobacco applied to its head. A short time after his mother missed him, and on going out, found him returning to the house, pale and nearly incapable of helping himself, and on going up stairs, he involuntarily voided his fæces: he soon became comatose, and died in three hours. On examination of the brain there was only found a slight effusion opposite the diseased part.

Opium produces, in addition to the symptoms mentioned, sleep, with apoplectic sterta, total insensibility of the eyes, the pupils of which do not contract when the strongest light is applied: large quantities, however, have been taken with impunity, but innumerable instances are on record when it has proved fatal; and the effects, during the whole time, are coma, with apoplectic sterta, succeeded by convulsions and death. On dissection the stomach is found invariably inflamed, and coagulable lymph effused between the coats. The first effect of this drug seems to be stimulant; the second, sedative. In one case the pulse rose at first from 76 to 86, and then sunk to

65: from this circumstance the conclusion may be drawn, that it should never be given in active inflammation alone, or at least till previous evacuations are had recourse to: its operation is thought to be directly on the nerves, suspending their irritability.

TREATMENT OF VEGETABLE POISONS.—If called to a person during the first stage, when the narcotic has not been long taken, give a large dose of the sulphate of zinc alone, say from fifteen to thirty grains: or the tartarized antimony from ij. to iij. grains combined with it. Endeavour to make him swallow warm water plentifully: to *facilitate* the operation of the emetic, and to *counteract the effects of the poison*, it should be *strongly acidulated* with lemon juice or vinegar. Having thus attained your object, if the patient should be comatose, as is generally the case, make him walk about the room supported. He will appear to have no fear of death, and only wishes for sleep, but keep him in constant motion notwithstanding, and by no means indulge him in this propensity; and if not acceded to willingly, exercise must be enforced. If incapable of standing, he must be continually roused, and his body rubbed with warm salt and stimulating applications. Diffusive stimuli may be given, as the ammoniæ in considerable doses; and when the vital energy is rapidly sinking, endeavour to rouse it to action by powerful stimulants, as brandy, &c. To take off the accumulation of blood in the brain, and prevent effusion or extravasation, it will be right to open the jugular vein in *some urgent* cases; but this practice requires much discrimination. A blister may be applied to the nape of the neck, and mustard cataplasms to the hands and soles of the feet. Flour of mustard, united with warm water, is not only a good stimulant, but it also possesses emetic properties. The sulphate of copper is sometimes used instead of zinc. Query:—As tartarized antimony is known to act almost immediately as an emetic if injected into the median vein, and equally as effectual as if swallowed, might it not be advisable to adopt this plan when the patient is insensible? or when there is an almost insurmountable difficulty in getting down a sufficient quantity of an emetic solution to operate expeditiously? or when got down, the action is deferred, or altogether lost, from the torpidity of the stomach?

Among vegetable poisons may be enumerated, besides those already stated, the small agaric, or champignon, mistaken for mushrooms, laurel-water, nightshade, foxglove, &c. Foxglove operates generally by lowering the pulse in a few minutes, without any increased action of the pulse previously; it has the same effect in health; the pulse becomes irregular as well as slow.

I have read lately of several instances of *oxalic acid* being mistaken for Epsom salts, consequently taken, and terminating fatally: chalk and water given soon after it has been swallowed may be considered an antidote for this poison, as it decomposes the acid in the stomach, and produces oxalate of lime.

Vegetable poisons act only, or principally on the nervous system. The American poison, used by the Indians for their arrows, is similar in appearance to cicuta. To shew its effect the following experiment was made on a rabbit: a slight incision was made with a lancet, and about one-sixteenth part of a grain of the poison was inserted; in about five minutes the animal began to drop its ears, then became convulsed, and in two minutes more died. The poison seemed to operate rather gradually, the voluntary powers first ceased, then the involuntary, and lastly the heart. Even if the principal nerves are divided the effect is produced.

ON MINERAL POISONS.

The *oxymuriate of mercury*, when swallowed, acts *immediately* on the stomach, producing in it excessive pains, attended with vomiting and purging, heat in the throat and extreme thirst, restlessness, slight convulsions and great debility: it seems to occasion death by the irritability produced. If called upon to examine the body after death, be careful that you leave nothing undone on your part for the purpose of ascertaining whether it is occasioned by poison or not, and if so, of what nature, as your evidence will have great weight in a court of justice. Adopt this plan: make a ligature around the duodenum and œsophagus, then take out the stomach, pour its contents into a vessel, wash the stomach out as clean as possible, retaining the water in a bason; then cut it open. If this poison have been taken, the stomach will have the *appearance of red velvet*, that is, *generally inflamed:* this poison *not only universally inflames the stomach, but also the small intestines.* I am aware, that it is stated from experiments lately made, that small quantities do not produce this effect, but I do not believe this to be the case. I should not remain satisfied in my own mind unless a ligature was also made on the lowest extremity of the ilium; and the contents of the *small intestines,* as well as their appearance, ought to undergo the strictest scrutiny. The fluid is next to be examined: a portion of it is to be put into a tube, evaporated, and the remains sublimed with heated charcoal, which will give running mercury. To another portion add an alkali, and a brown powder will be precipitated; pour off the clear fluid, sublime, and mercury will be discovered. Oxymuriate of mercury may be precipitated by the carbonated fixed alkalies, and by lime water in the form of an orange, or orange yellow coloured deposit. The muriate of tin is countenanced by Dr. Bostock, of Liverpool.

When *arsenic* has been taken, it produces the same symptoms as the before-mentioned poison in the first instance: the abdomen is distended, the extremities cold, evacuations both by vomiting and by stools of an offensive odour, hiccups, &c. In addition, persons frequently die with twitchings and strong convulsions. In the examination of the body, the same cautious proceeding is requisite: the powder of arsenic often adheres to the stomach, so as to require it to be scraped off. Arsenic *inflames a good deal,* but in PATCHES, being a substance not so soluble as the oxymuriate of mercury; *this serves as a mark of distinction.*

Put the liquor for inspection into a bason, add warm water to it; then a little dry powdered charcoal, and also potash well dried; and a *yellow precipitate* will be afforded: put it into a glass tube over a lamp, and a regulus, or ring of *metallic ar-*

senic, will be found on the glass on the surface of the powder: *no other* metal has been found to rise from a precipitate in the same manner: this is the most *absolute proof* of it. The flux used in the fusion of metals will answer the purpose, as it contains potash. By this method Dr. Marcet operated with one-tenth of a grain, and the presence of metallic arsenic was abundantly shewn by the regulus which was formed.

Mr. Hume's test is this: pour boiling water on the suspected fluid, and filter through paper: dissolve the nitrate of silver (lunar caustic) in from nine to ten times its weight of distilled water; then gradually add a solution of ammonia, and a precipitate will be formed: continue to add the solution of ammonia till the fluid again becomes nearly transparent: procure a strip of glass, dip it into this last solution, and apply it to the first liquor supposed to contain arsenic. If a bright yellow immediately appears, it may fairly be concluded arsenic is contained, as the arsenic is thus combined with silver.

Bergman's test is this: a solution of vegetable alkali, as the potass. carbon., is to be added to the suspected liquor (united with boiling water and filtered). Let it stand an hour or two; then pour upon it a solution of the sulphate of copper, and if arsenic be contained, the copper will be converted into a beautiful pale green precipitate, which is Scheele's green pigment.

Note. This deposit may be imitated by an infusion of onions, united with the carbonate of potash and sulphate of copper, which would produce an exactly similar precipitate. Other tests may be enumerated. If a few grains of arsenic can be obtained from the stomach, and they are thrown on a red-hot iron, you will perceive a smell like garlic: if they are placed between two plates of copper, and exposed to an intense heat, the copper will be found whitened.

Treatment.

The object to be kept in view, is to evacuate the poison as speedily as possible; and a powerful emetic of the tartarized antimony, or the sulphate of zinc, must be immediately administered: get the patient to drink *plentifully* of mucilaginous and gelatinous drinks, to sheath the stomach as much as possible. I have great doubts whether we can succeed in preventing the influence of either the sublimate or arsenic; although with respect to the oxymuriate, good may be done chemically by giving an alkali, as it decomposes it. If this cannot be directly procured, give soap and water, or chalk. Alkaline salts are found to lessen the destructive effects of these powerful minerals; such as the potass. sub-carb. or the potass. sulphuret. If a decomposition can be fortunately effected, it will be extremely desirable. Orfila says, the albumen, or white of egg, is the most powerful and efficacious antidote for the oxymuriate. Should success attend our efforts, the subsequent inflammation must be kept under by copious bleedings, blisters, and the oleum ricini as a purgative.

It is a curious fact, that if arsenic or the oxymuriate of mercury be injected into the jugular vein, they act on the stomach, and produce inflammation of it, and intestines, as if introduced at once into that organ: a solution of the latter was injected into the jugular vein of a dog; vomiting soon came on, and death: the stomach and also the intestines were inflamed. Afterwards a similar experiment was made with arsenic, with nearly the same result. If injected into the arteries, all the living powers are speedily destroyed, and violent contractions of the muscles are produced, which render them white.

It should be recollected, a solution of the stomach, *apparently occurring* from *inflammation*, and *gangrene*, IS NOT *indiscriminately* to be considered in that light, and this caution is particularly necessary when called in to inspect the body of a person who has suddenly expired. John Hunter first noticed this circumstance; a more accurate observer probably never existed: he found that the gastric juice alone was capable of dissolving the coats of the stomach after death. This was found the case in those who suddenly were deprived of life in the full enjoyment of health and vigour, and in those who died from long and protracted disease. Neither on the other hand should it be hastily inferred a person did not die from poison where its presence could not be detected, as the metallic poison might be so evacuated by vomiting and purging, as to leave no trace of its actual existence by chemical analysis.

Lead appears to act spasmodically on the stomach and bowels. On opening a man who had taken a considerable quantity, the intestines were found burst, and the cellular membrane inflamed with air. The spasmodic action sometimes goes to that extent as to rupture the blood vessels in the stomach, occasioning an excessive hæmorrhage. A little sulphuric acid will detect the presence of lead, which is precipitated in the form of a white powder. The potass. sulphuret. or lime, precipitates it of a blackish colour.

Copper, when taken, may be detected by the beautiful blue colour produced in its solution by pure ammonia. If alarming symptoms are occasioned by eating food dressed in a copper vessel badly tinned, charcoal will be found of great service. If *verdigris* have been taken, emetics, and then alkali, must be resorted to, and from the chemical action which saccharine matter has on verdigris, rendering it insoluble in water, sugar may be given.

LECTURE XIII.

ON INJURIES OF THE HEAD.

I SHALL commence this subject with superficial injuries. On account of the *occipito-frontalis muscle*, (which has its origin from the transverse protuberating ridge of the os occipitis to the basis of the mastoid process of the temporal bone) spreading into a very broad tendon, which covers the upper and lateral parts of the head, and extending to the integuments of the eyebrows, and even to the dorsum of the nose, and its *adhering* to the skin of the head, and being *attached* to the bone *only* by a loose cellular structure, forms a considerable interstitial cavity, and owing to this peculiar structure is seen so frequently to arise from a puncture in this part or wound, an erysipelatous inflammation; this may, perhaps, be ascribed to the injury done to the cellular membrane: the parts become red and inflamed, and if not properly treated in the first instance, suppuration commences, and numerous abscesses form under the tendon, and sloughing will ensue from portions of the tendon becoming dead: the reason appears to be that a tendon is very slow going into an inflamed state, but when it does, is very subject to mortify. I have seen from a blow on the head, which a person received, and from the stunning effect of which he recovered, matter form under this tendon, and make its way under the eyelids, so as to enlarge them so much as to prevent the person from seeing: the matter had a communication with the abscess by means of the cellular membrane. Master Edw. Davies came to me with a simple wound on the forehead, and adhesive straps were applied. In the course of a week he was sent to me again; the wound had almost shut; both his eyes were nearly closed; a collection of matter was evidently the cause; the wound was enlarged considerably, and a poultice ordered to be applied; and *this is the treatment to be pursued.* The incision must be a free one.

The *temporalis* is covered by a particular fascia or aponeurosis, which is attached to the cranium and zygomatic arch; it is a dense tendinous structure. Inflammation will occasionally take place in the cellular membrane, between this fascia and muscle, which will continue until the formation of matter, which is very liable to make its way under the zygomatic arch, and burst into the mouth. Sometimes inflammation will proceed so far as to set up an ulcerative process, which affects the bones, and large portions of those diseased will come away. The coronoid process has been known to exfoliate from it. The symptoms are a slight tumefaction in the temple, great pain in the lower jaw, so as to prevent the patient's eating; the redness is not always apparent, so do not be deceived by this. If inflammation be considerable, blood should be taken away in a general way, and locally; the bowels are to be kept open, and if the inflammation still continues, bleed from the temporal artery. If matter form, a free incision should be made through the aponeurosis, so as to allow of a sufficient outlet for it to escape.

ON INJURIES OF THE CRANIUM, &C.

The *general* symptoms consequent to an injury of the cranium are loss of sense and volition: the parts below become paralytic (paraphlegia), sometimes on one side only (hemiphlegia): both pupils much dilated (occasionally but one, but this happens where the brain is affected only on one side, or more that side than the other): bleeding at the nose, and sometimes of the ears also: the breathing takes on that kind of sterta which accompanies apoplexy, pulse slow and laborious, and often intermittent; and this often, when the least exertion is made, will be quicker, and take on an irregularity. The stomach becomes affected: in fact, an instance, I believe, was never known, of an injury done to the brain, without this organ being more or less affected by vomiting. Sometimes blood is thrown up; but this should not excite any alarm, as to its proceeding from internal hæmorrhage, as in this case it passes from the nose into the throat. Costiveness also is an attendant symptom: there are other minor symptoms which do not merit a particular attention in this general description.

The injuries of the brain are commonly divided into two states or classes: concussion and compression: the latter being the effect either of extravasation of blood, of effusion of serum, pressure of bone, or formation of matter:—others add, loss of some part of the substance; and, lastly, inflammation from an injury.

ON CONCUSSION.

The symptoms of concussion resemble very much those of intoxication, so much so, that if a surgeon should be called to a patient (who in consequence of having fallen down, from excessive drinking, and yet received no injury), he may be led to suppose that the symptoms indicate concussion of the brain: the first question, therefore, should be directed to ascertain the state of the patient before he fell—he appears possessed, as it were, with sound sleep, a kind of slight delirium, and sometimes coma; his voluntary motions, as well as his senses, are lost apparently, but he breathes without any kind of restriction: his pulse rather slow than otherwise, but on rousing him, or on the least exertion on his part, the difficulty of breathing, with an increased motion of the pulse, comes on immediately. Vomiting, in this affection, is generally a striking and attendant symptom: his mental powers are considerably diminished, but commonly are retained in a small degree. His natural wants, or calls of nature, will cause him to those desires, as if they were implanted in him by instinct; he will get out of his bed, void his urine, but when got into bed again, all that can be done to rouse him, and make him sensible of any thing, will be ineffectual and vain. A striking instance of this I heard mentioned, in a gentleman who had unfortunately met with this injury; no answer could be got to any questions put to him at his bed-side, but it was observed, after the attendants had left the room (having narrowly watched for that purpose), that he got out of bed to pass his urine, after which he again laid down, and immediately on approaching his bed-side, not an answer in any shape whatever could be obtained: this proves, evidently, that they attend to the calls of nature merely from habit, which is so strongly fixed in them, as not at all to be done away with, though all other motion and sense seems to be quite obliterated. If the concussion should not have been violent, yet sufficient to stun the person, accompanied by giddiness, noise in the ears, loss of memory, and stupefaction, and these symptoms go off, it may be concluded, that no very serious injury has happened to the brain, further than the immediate shock: the patient should be requested to live abstemiously for some time, and by no means to indulge in any diet that would be likely to hurry the circulation, as inflammation will be very apt to follow. The patient is to be bled, and purgative medicines administered—every trace of the symptoms will, in all probability, go off in five or six days, but if they continue beyond that period, it may be concluded, inflammation has taken place, and the necessary measures decidedly pursued; and when inflammation is thus complicated, the nature of the injury is more obscure. No patient is safe from the effects of concussion, till fourteen days after the accident. Mr. David Watkins, a farmer, met with this injury in returning from market, and he was intoxicated at the time; I concluded, at first, the symptoms were merely those of drinking to excess; however, as a neighbour stated, he fell on his head: as a measure of precaution, I only gave him a purgative medicine, as it was late at night, and the following morning, early, I again saw him, when the symptoms were more decided, and I pursued the usual means, as will be hereafter detailed:—being the father of a large family, whose anxiety on his account was great, induced me to pay him the very greatest attention, but it was several months before he recovered notwithstanding. In the case of a surgeon's mate, mentioned by Sir Everard Home, the effects of such an injury were protracted to a much more remote period: at the end of six months he was in a great measure recovered, but wanted the power of walking straight, and had lost his memory: his complete recovery did not happen till the end of twelve months. This depends entirely upon the nature and extent of the injury.

To distinguish concussion of the brain from other injuries of that important organ, it will merely be necessary to state the symptoms, particularly marking this injury, and this will lead to the distinguishing it from others: many of these I have before mentioned, but some of them accompany other injuries of the head. A blow on the head often produces symptoms not before existing. The respiration, as I have observed above, is free, unless some exertion is used. The symptoms *come on immediately after the accident:* the pulse at the time pretty regular, soon becomes quicker and fuller: simple concussion causes another action of the brain, by which its functions are deranged, and the action of its vessels is increased: but this does not last a great while, as the brain sets about immediately to restore the injury which it has received; and which, if the blow inflicted is not violent, it soon effects: the pupil of the eye will be observed immoveable; the extremities cold, and the muscles of the limbs are *not relaxed,* as in the state of compression.

In the *treatment* of concussion we are generally led to the same method as that of inflammation, and it should always be considered in that light. As vomiting comes on commonly in this affection, many practitioners, when this is not the case, endeavour to excite by medicines that effect: perhaps there may be some degree of propensity in it as endeavouring to fulfil the intentions of nature; but I have never had an opportunity of deciding this point, as in every case I have met with, vomiting has come on naturally. There are *two objects* to be kept in view in the treatment of concussion: the first is, to prevent an extravasation of blood in the brain, when it has been lacerated; and, secondly, to guard against inflammatory action. The first purpose, as well as the last, will be attained by venesection; but there should be particular care not to draw blood *directly* after the injury has been received, as at that period it would tend to weaken the living powers too much, which are already in a feeble state, from the violent nature of the shock: many instances have proved fatal, from this observation not being properly attended to; it is therefore necessary to wait until the pulse indicates bleeding, by its fulness or quickness; it has already been mentioned, it is regular at first. The danger that arises is from existing inflammation, which should be prevented by all possible means; and as soon as we are warranted to bleed, by the state of the pulse, &c. to do so. In case the patient is of a plethoric habit, the quantity drawn should be pretty large; but this will, in a great measure, depend on the patient, and the violence of the symptoms: the strongest and best indicative I know, is a strong pulsation of the carotid artery. The pulse must be watched with attention, and it will be better to take away a small quantity at first, in some cases, and frequently repeated; the contrary practice has been seen to be attended with fatal effects, as tending to lower the constitution to a great degree. In my opinion, the nearer the part affected that the blood is drawn the better: I should advise opening the temporal artery or jugular vein, in preference to bleeding at the arm. The bowels are to be carefully attended to; small doses of calomel at night, with the magnes. sulph. given the next morning, will be found useful in evacuating the intestinal tube, which ought to be kept in a general state of irritation. Mr. Abernethy, I have reason to believe, concurs in this plan of treatment, but he recommends purgatives of a more drastic kind. Sudorifics and antimonials are also to be given for the purpose of relieving the body of its redundancy, and exciting the different excreting ducts to action. Opium, if combined with antimony, requires a degree of nicety in the administration of it; alone it is improper. The *local* treatment to be observed consists in the application of a blister to the head, after a few days has elapsed, which is attended with very good effects, and ought not to be omitted. If there be any wound on the scalp, it will be right to apply stimulants to it, in order to produce a quick formation of matter. Blisters operate by taking off the determination of blood to the brain, effecting what is termed a retrovulsion or counteraction. All stimulating substances, with respect to diet, &c. should be carefully avoided: the food should be as light as possible, such as panada, water-gruel, &c. The patient should be kept free from all noise and conversation, and even from the stimulus of light: after recovering from the most urgent symptoms, many are liable to paralytic affections, strabismus, fatuity, and other nervous diseases, so that the recovery is imperfect: electricity, in these cases, will be found very beneficial. In concussion, I have never witnessed, or read detailed, any great benefit from the use of the trephine, nor can I recollect any case where it has been successful.

Remarks.—Is the liver affected to that extent Desault would persuade us, in concussion? Is it found inflamed and supurated in those who die from this accident? Would not the plan of an eminent surgeon, in the Prussian service, of the name of Schmucker, be worthy of adoption externally: it is, a lotion applied to the head, of spring water, vinegar, nitre, and sal-ammoniac; and would not this be manifestly increased in effect by a large blister on the nape of the neck, kept open with savine cerate?

ON COMPRESSION.

The symptoms of compression differ from those of concussion in this, that we find in the former that apoplectic sterta, which accompanies it always in a great degree, and also attended from the first instant with extreme slowness, oppressiveness, and irregularity of pulse: the loss of sense and voluntary motion is not *immediate,* as in concussion; it comes on *gradually:* the limbs are pliant, from the relaxation of the muscles: the pupils of the eye are much dilated.

When the brain of a living animal is compressed, by the finger, for example, it excites immediately an uneasy sensation, from which the animal endeavours to extricate itself: on pressing harder the animal becomes irritated: on still further pressure the pulse gets exceedingly slow: on withdrawing the finger a severe giddiness follows. From this experiment may be seen what effect compression of the brain has upon the human species.

Compression is commonly the result of three causes: the first is extravasation of blood, or serum; the second depression of bone; and, lastly, the formation of matter. When, from extravasation, the symptoms come on gradually, and according to the quickness that the fluid should have been effused. After a blow has been received, the result of which is extravasation, it is found, on opening the cranium, that the extravasated fluid may be situated in *three* places: on the dura mater, on the pia mater, and in the substance of the brain itself. In the *treatment* of this accident, viz. from extravasation, our principal objects must be to guard against inflammation, and promote absorption: the symptoms may not be so violent in the first instance, so that the patient recovers from the first attack, and may continue, perhaps, tolerably well for two or three days; but this seeming recovery must not put the surgeon off his guard, and prevent his using active depletion, as the patient otherwise will sink under the compression caused by the effused blood: blood-letting I consider as the best and shortest step to take, and must not be done with a sparing hand, unless it is directly contra-indicated.

With respect to the use of the trephine, in two states of this injury, it will be improper; first, when the effused fluid is on the pia mater; and, secondly, when in the brain itself: it will only be found beneficial when situated between the dura mater and the skull itself; and it is evident, that the use of the trephine is of very little use in the two first states, as it is impossible, after the opening has been made, to discharge the contained fluid without the greatest hazard.

Previous to trephining, supposing it were proper, we should bleed freely, and take care to evacuate the bowels: if the symptoms continue undiminished, we should not hesitate about the operation, as the risk in its performance is not equal to its neglect, and will be the only chance of preserving life. Look carefully at every part of the skull, and make pressure around it with the finger; if by doing so any pain or uneasiness is excited in a particular part, there the trephine should be applied. It has been the practice to operate on any part that has been bruised, but I think with a degree of hazard, as it is often found that blood is extravasated, on the opposite side of the head; after having made the opening with a scalpel, if we should *not find* the pericranium *detached* from the skull (which will be the case if there is any fluid between the dura mater and the cranium), I do not conceive we are warranted in proceeding any further, *except in one instance*, which is if a blow have been received on the lower part of the parietal bone, just where the artery enters; and if the symptoms should be violent, in this case I would advise trephining, as in dissection of these cases a fluid extravasated between the dura matral artery and bone, from the vessel yielding to the violence of the blow, is commonly observed.

The operation of trephining is very generally given up, except in cases of fractures; but it may be proper under two circumstances in a limited way, namely, from extravasation and depression; and in some cases it requires the greatest judgment to distinguish, as to its propriety or not.

ON FRACTURES OF THE CRANIUM.

These are to be considered in the same light as other fractures, when unaccompanied with extravasation or depression. It is no uncommon thing to see patients brought into the London hospitals with simple fractures, which do very well. I saw an instance, where a man was brought in with a fracture of the cranium, attended with symptoms rather violent: he was immediately bled freely on his admission, and by the time the surgeon arrived, under whose care he was taken in, he was greatly relieved, and in a short time after quite recovered his sensibility:--this single case (and I might adduce many others) sufficiently shews the use of depletion, before we proceed to the use of the trephine; for instance, had the operation been directly performed, in the above case, the worst effects might have resulted. A fracture of the cranium is not to be considered dangerous, when neither extravasation or depression is present. When the basis of the skull is fractured from a high fall, from the whole pressure of the body resting upon that part, on opening the brain and tearing up the dura mater, extravasated blood is commonly observed; this kind of fracture must inevitably prove fatal, nor can it be discovered till after death. A fracture sometimes occurs in the orbitar process of the os frontis: an instance of this was seen some time ago; a child had been playing with a pair of scissars in her hand, upon which she fell and the point perforated the orbitar process of the os frontis: inflammation soon came on, which shortly proved fatal: on examining the brain there was evident marks of an extensive action in the vessels by the great redness present. We should trephine in cases of fracture with depression, accompanied by symptoms of extravasation. There may be depression without affecting the brain, so as to produce symptoms of depression, but this is a rare circumstance. Mr. Home mentions a case of a colonel in the army, who had a portion of the parietal bone so depressed, that half a pigeon's egg might be laid in the place, yet he is not sensible of any injury, unless he drinks too much wine, which deprives him of speech. I recollect a somewhat similar case, in one of the commander's of the Prince Regent's yacht.

Treatment.

If there should be a fracture with depression, and no marks of injury to the brain, we should not trephine; but if, on the contrary, there are evident marks of injury, in case they do not subside in the course of a few hours, after the depleting plan has been pursued, the operation will be sufficiently warranted: but there will be no necessity if the fracture be a simple one, unless urgent symptoms exist. A slight degree of pressure does not derange the functions of the brain—yet a simple fracture may require trephining, when evident symptoms of extravasation exist. In compound fractures, with depression, it will be proper to trephine, whether there are any existing symptoms or not; on this principle, that it is required to prevent succeeding inflammation. Many labouring under evident marks of compression have been known to have remained so for some months, and recover after the cause had been removed. An instance of this occurred in a sailor, who had fallen from the yard-arm of a ship; he was carried into the hospital at Gibraltar, but not recovering there his friends brought him home: a surgeon was consulted, and on examining him, he was satisfied there was some pressure existing, which had produced and continued those symptoms of compression under which he had laboured for six months before: he was trephined, and the result was favourable.

This case evidently shews, that there will be beneficial effects even from the late use of the trephine; and I only mean to shew, that if the operation should not have been performed in the beginning, yet it will prove advantageous when the cause has long existed. We should recollect, when the trephine is proper, to operate before inflammation comes on, as afterwards it would only hasten the death of the patient. Two boys were brought into an hospital, with fractures of the os frontis, with symptoms of compression: one had active inflammation, and in this state he was trephined; he survived but a short time subsequently: on dissection, very great vascularity and distention of the vessels of the brain were apparent. The other boy was trephined, previous to any inflammation, and he did well. Fractures, with depression, sometimes injure the brain, and are in general fatal:—but instances have been known to the contrary. A man was brought into St. Thomas's Hospital with a fracture of the os frontis, accompanied with depression, and part of the bone pressing through the pia mater: it was elevated to its proper place, and the man recovered: this case merely shews, that what in general may be considered as desperate cases, sometimes are known to do well, so that there may be always a glimmering hope entertained.

FUNGUS CEREBRI, OR ENCEPHALOCELE.—*Wounds of the brain* are commonly followed by *fungus:* the treatment of it is of the utmost importance, for if left alone, or improperly managed, the consequence would be fatal: sloughing would come on, so as to cause inflammation, the result of which will be suppuration of the brain. This fungus is formed of coagulable lymph on its surface, and brain at its root, and is insensible, owing to its little vascularity, and growth being too rapid to allow of its being organized. The treatment is simple; if it projects through the bone, cut it off by means of a silk ligature tied round its base, or it may be pared off with a knife; then apply a piece of lint, over it a strap of adhesive plaster, then bind a proper bandage over the whole.

From violent blows on the head, a portion of bone will sometimes be forced into the substance of the brain, producing epilepsy, and its result. A case of this kind, which terminated favourably, occurred to Mr. Foster, one of the surgeons to Guy's Hospital. A man was brought in with a considerable fracture, with depression; violent epileptic fits came on, and the prognosis was very unpromising. Mr. Foster having raised the depressed bones, discovered that a small portion of it, not larger than a thorn, had pierced the substance of the brain; the man on the removal of it speedily recovered. In case a part of the brain has been lost, from the severity of the accident, if that portion lost is not greater in extent than that of the fractured bone, I should not trephine.

ON THE FORMATION OF MATTER WITHIN THE SKULL.

In injuries of the brain, many days and sometimes weeks will elapse before inflammation supervenes; and it is generally the case, that the progress of it is much slower in this organ, than in other parts of the body; when it happens, the first sensation is, an acute pain in the head, with a cessation of discharge from the wound; and the wound, which before presented an healthy aspect, assumes a livid and glossy appearance: on feeling carefully around its edges, the parts, as in anasarca, yield to the finger on pressure, and will have a very flabby feel. This is owing to a quantity of extravasated serum: the flabbiness of the skin is not merely confined to the edges of the wound, but extends a great way over the scalp. The patient's countenance is much flushed, and on observing the eye, the tunica conjunctiva will be very red and vascular. There may be many alterations in the symptoms, in the course of twenty-four hours: at one time the patient will have a depressed countenance, and to all appearance in a dying state, but on visiting him an hour afterwards, perhaps quite the reverse will be found. Vomiting commonly takes place, but the most certain mark of the formation of matter going on, is the patient being seized with violent shiverings, which often remit similar to those of an intermittent fever. The sooner relief is had recourse to, the more likely is it to be attended with success. The seat of the matter is similar to what takes place in extravasation, namely, in three places: first, between the dura mater and the skull; secondly, on the pia mater; and, lastly, in the brain itself. When situated on the dura mater, the only and quickest relief is by means of the trephine; the matter escapes after a little while through the bone. The perforator alone is occasionally used with success. This latter instrument is proper when the skull is very thin, as in very old, or infantine subjects: here the saw would be likely to wound the dura mater, which must always be cautiously avoided. I wish I could say, that the operation for the discharge of matter, when seated between the dura mater and skull, was always attended with success, or even in the majority of instances; but I am sorry to state, from what I have seen, that I believe there are but few that survive: and there is still less chance when matter is on the pia mater, much less in the brain itself; for if an opening be made through the dura mater, the probability is, that the patient will die from inflammation.

THE OPERATION OF TREPHINING.

The instruments required are few: a knife with a double edge; two crowns, with perforators, one smaller than the other; an elevator, a probe and brush.

The parts that should be avoided, if possible, in the operation, and which ought to be well known, are these: a line drawn from the nose to the ridge of the os occipitis, on account of the frontal and longitudinal sinuses, and the falsiform process of the dura mater. Avoid the lower edges of the parietal bones, which are anterior to the ear, and nearly at its superior part, as at the anterior and inferior angle the foramen for the dura matral artery lies; not but the hæmorrhage might be stopped, and consequently, if an operation be required on that part, it certainly may be done; but if it can be avoided so much the better.

When called to a fracture with depression (supposing the symptoms warrant an operation), the first thing to be done is, to make a longitudinal incision, which should be about two inches in length, so as effectually to expose the whole extent of the fracture; but the length of the incision must depend, in a great measure, upon circumstances; then raising the pericranium in the same direction, apply the trephine in the manner I shall hereafter describe. It will be better practice to make a *crucial* incision, and remember to make it chiefly on the sound portion of the bone, I mean that which is near the fracture, but remaining in its situation; or about two-thirds on the sound bone, and one-third on the depressed portion: having made the crucial incision, and having raised the pericranium in the same direction, taking care not to raise *more* of the latter than is absolutely necessary, as exfoliation will be more likely to take place, the trephine is to be applied, pushing down the pin in it, which then becomes a perforator, and work on till a complete circle is made, and the saw remains in its place, without the aid of the pin, which is then to be withdrawn. It has been remarked by some authors, that the operation ought to be proceeded in till a bloody discharge from the diploé; but if this were to be attended to indiscriminately, it would lead us often into great and fatal errors; for instance, in old and very young subjects there is no diploé: the pressure of the saw must be made very even, and if the bone have yielded in one part before another, the saw must be worked on that part which has not given way. As soon as it is found, *by sounding with a probe,* (which should be done *frequently*), that the bone is *loose* at any one part, pass in the elevator at that part, and disengage the piece of bone.

I think, from what I have seen, that it is advantageous to have a small circle, and to take care that it is of an equal depth, to be certain of which it must often be examined with a probe. The operation of trephining should not be done in a hurry, as the probability will be greater of wounding the dura mater; the surgeon ought to be very cool and steady. When the portion of bone is removed, if we are looking for extravasation of blood, we shall find it escape immediately, if there be any present, but if none be perceived to escape, we are not warranted to proceed any further, according to the opinions of some of our best operating surgeons, although I have my doubts of the propriety of this practice. If the operation be performed with the view of elevating a depressed portion of bone, the treatment required after it has been effected is very simple: bring the edges of the wound together, and lay some lint over the part, and in the course of a day or two a poultice ought to be applied, and the subsequent treatment will be that of a common wound.

I must observe, when we are certain, from the symptoms, that there is matter under the dura mater, in such a case, I say, it may be proper to make a cautious puncture with a lancet, as the risk will not be greater, and the patient certainly will have a better chance for his life. The sensation of fluctuation, often apparent to the feel, is apt to lead many into error, as after an opening has been made no fluid could be discovered, and this has happened in several instances; therefore particular attention is required to the concurring circumstances, before we make a puncture.

The scalp is often affected with erysipelas after an injury of the head, and which inflammation extends to the face, owing to an injury done to the tendon of the occipito-frontalis muscle. In this case, it will be proper to make several openings, and apply bandages, all around the head, except at those parts opened, from which there must be a discharge kept up. When matter forms under the tendon of the temporalis, it is advantageous to make a longitudinal incision early.

LECTURE XIV.

ON HYDROCELE.

By hydrocele, derived from the Greek ὕδωρ, water, and κηλη, a tumour, is meant a collection of water in the vaginal coat of the testes; the cyst in which the fluid is contained will be better explained by the following anatomical description. The testicles are situated obliquely upwards, hanging loosely in the tunica vaginalis, the left being lower than the right. Within the scrotum is situated a bag, formed by the peritoneum, assuming the appearance of a bladder nearly empty, and taking the name of tunica vaginalis, and this membrane is *reflected* over the testicle, as the pericardium is over the heart. The testicle consequently has three coats: first, and the outermost, is the tunica vaginalis reflexa; secondly, the tunica vaginalis propria; and the third, the tunica albuginea. The epididymis is situated at the upper and *outer* side of the testicle, and by this circumstance the right can be distinguished from the left. *Between* the tunica vaginalis propria, and reflexa, is naturally contained a vapour, which when condensed and collected in any considerable quantity, forms the common hydrocele.

The signs marking an hydrocele are, first, a tumour will be observed in the lower part of the scrotum, and can be easily pressed from one extremity of it to the other: it gradually ascends from *below* upwards, as the swelling increases in bulk and size; it becomes light and elastic, and affording resistance to the hand on pressure; it extends over the anterior part of the scrotum, and is of a pyramidal shape, somewhat resembling a large pear: the *upper* part, or base, is considerably smaller than the lower: it is unattended with pain in general, and it is some time before the patient discovers it, and then accidentally, and this proceeds from the before-mentioned circumstance, namely, want of pain, and also of its little weight: but if there be any inflammation present, then, of course, it will be painful. When it gets very large the patient commonly feels a painful sensation in the loins of the diseased side, also occasionally at the spinous processes of the ilium. An hydrocele thus formed is generally transparent, which may be detected by exposing it to a candle: but there are circumstances which prevent this transparency sometimes from being discovered, by merely holding it to the light of a candle; recourse must be had to other means; having previously darkened the room, grasp the tumour at its lower part, so as to squeeze the fluid anteriorly, then putting a lighted candle at its anterior surface, the transparency will be visible.

The scrotum in this disease is undiscoloured, and the size of its vessels very little enlarged: the scrotum also slips over the vaginal coat or tunic, which circumstance adds much to the knowledge of the disease. On applying the fingers, a fluctuation will be discovered from one extremity to the other; whereas, when other fluids are contained, the fluctuations are confined to one spot; and this, with that of its little weight, will add much towards distinguishing it from other affections of these parts:—there are certain varieties that an hydrocele assumes, and which, if the surgeon be not properly acquainted with them, may lead to great errors. It is sometimes a double tumour, one in the scrotum, the other above the abdominal ring, in consequence of its distention above the ring giving it a double appearance. An hydrocele is not always transparent, that is, the fluid which it contains: either this may arise from the state of the fluid, or a thickness of the tunic, in consequence of the long existence of the disease; so that when it is cut open, it does not fall down upon the testes as usual, but remains fixed, having the appearance of cartilage. It has sometimes been found ossified, but this rarely. One instance only has been seen, and within this ossified tunic it was discovered, that the water contained a mucilaginous substance. The vaginal coat has occasionally a cyst on one side of it, containing water; this is, from a partial adhesion taking place after inflammation.

The spermatic chord sometimes passes entirely through the cyst; in this case the trocar should be passed rather on the outer side of it. The nature of the fluid varies a good deal, and it is no uncommon thing to find it bloody: if this be found the case, after the operation has been performed, the injection made use of should be much weaker than usual, by about one-third; the reason is, the result of an inflammatory process, and if a strong injection were made use of, it would run the risk of exciting too great action and irritation of the parts, which would most probably terminate in suppuration. Instances have been seen, but they are very rare, of a purulent fluid in the vaginal tunic, of a yellowish colour, resembling pus, sometimes so viscid as to be ropy. Cartilaginous substances are also occasionally found loose within this tunic.

There are several diseases with which an hydrocele may be confounded:—in the first place, with hernia. A careful inquiry should be made into the history of the case, and take particular care to be informed of its origin, &c., whether the tumour began from *below*, and extended upwards, or vice versa. Again, direct the patient to cough; if it be hydrocele, there will be no dilatation, but if hernia there will; however, there are some exceptions to this as a general rule, which I shall hereafter notice. Another test of hydrocele, I may observe, is the distinctness with which the spermatic chord may be felt, which is not the case with inguinal hernia.

The exceptions that I alluded to, with respect to the dilatation of hydrocele, by coughing, are these: first, when a hydrocele is so extensive as to pass between the abdominal rings, this will dilate by coughing: also when the fluid, which is rarely the case, passes from the vaginal tunic into the abdomen:—but those just mentioned, if properly attended to, will not deceive, as they are perfectly transparent, and may be instanced as exceptions. It is proper to be thoroughly acquainted with the disease before operating, as otherwise fatal effects may ensue from wounding the testis. An hydrocele may be distinguished from an inflamed testicle, by the scrotum in the latter being red, and having a general blush on the surface; the vessels also of the testis are much more enlarged and numerous, besides, in squeezing the testicle gently with the hand, it will excite a considerable degree of pain. There are some diseases of a pulpy kind, liable, without some little attention, to be confounded with hydrocele, but may be easily distinguished by the feel, for if the fluctuation be in a general state, it will be an hydrocele; and otherwise, if it is confined in a fixed spot: besides, the *form* of it is different from any hydrocele, by being very flat. There is another disease which is often likely to be mistaken, that in which the tunica vaginalis contains blood, termed hematocele; this commonly is the result of a blow: the tumour, in its first formation, is sudden, of a solid texture, and of a pyramidal shape. The discriminating marks are these: on elevating the tumour it will be found of great weight, not transparent, and on inquiring into the case, it commonly will be found to have proceeded from a blow, or a similar accident. As it is, however, in some degree liable to be confounded with an hydrocele, and also with that state of diseased testicle termed scirrhus, it is right, to be certain, previous to the operation, to make an incision with a lancet, as from this small opening its contents can be readily known, and no bad effect will result from it; whereas several fatal instances have happened from not strictly attending and acceding to this mode; the operation having, without any previous opening with a lancet, been performed, by introducing the trocar, supposing it to be hydrocele.

The cause of hydrocele is an increased action in the vessels of the tunica vaginalis testis: this is proved by injection, when its vessels are found red and much enlarged, and in cutting open the tunic, a general blush is suffused over its surface; it has not this colour when injected in a healthy state. The absorbent vessels are also, in a diseased state, much increased in size, their diameter being about three times that in health. Diminished absorption has therefore nothing to do with the formation of the disease; and the real cause of it is, that of the secretion, owing to an increased action of the vessels, exceeding that of absorption.

The treatment is either *palliative* or *radical;* by the former only temporary relief is afforded, by the latter an endeavour is made to produce an union of the coats of the tunica vaginalis, by means of the adhesive inflammation. If the constitution be irritable, and the patient naturally timid, the palliative will be found the most proper in these cases, as, if the radical cure were to be attempted, the result might be very unfavourable, from too much irritation being caused in a constitution susceptible of it.

The *mode* of performing the *palliative operation* is thus:—grasp the lower part of the tumour firmly with your left hand, squeezing it anteriorly, then feel for the testicle in the lower part, which will be easily discovered by the degree of pain excited, then laying hold of the scrotum, pass a small trocar *obliquely upwards,* at its anterior and inferior part, by no means downwards, as the testicle would be more likely to be wounded: withdraw the trocar, leaving the canula, and when the fluid is evacuated through it, it may be removed; merely apply a bit of lint to the part, and over this a slip of adhesive plaster. Some prefer dividing the integuments first with a lancet, and then using the trocar, but that is unnecessary here. To prevent ensuing inflammation, have the parts washed with a lotion, composed of liquor. ammon. acet., or the ammon. muriat. dissolved in vinegar. The water will perhaps require to be drawn off, in the above manner, two or three times a year. Sometimes, however, a spontaneous cure takes place.

The water has been known to have been evacuated, and the tunic be completely filled again, a week after the operation; but this only occurs when the patient has a general tendency to dropsy, and should be treated accordingly; and I should make it a rule, whenever this tendency prevailed, to correct it before I proceeded to the radical cure. Even the palliative method of operating, although apparently so simple, has been known to have been attended with serious consequences, arising from constitutional irritation, caused by improper subsequent treatment, or want of care, such as undergoing fatigue soon after the operation, making use of spirituous liquors too liberally, or by high-seasoned food; all which, for some time, the patient should be enjoined strictly to avoid. Two fatal instances have been seen, where a mortification came on, after a great deal of fatigue, &c. An hydrocele sometimes bursts of itself, but will fill again: a blow received will occasion it, and perhaps, instead of being filled again with the same fluid, blood will take its place, so that knowing that a blow has been received, a practitioner would often be deceived if he expected a discharge of water on the introduction of the trocar; if any doubt exists, an incision should be previously made, as already stated.

It would appear, no age is exempt from this disease, and in the majority of instances in young subjects previous to the age of eight or ten years, subjects to hydrocele, the mere application of stimulant lotions to the tumour will disperse it, by lessening the action of the secreting vessels, and restoring the balance between them and the absorbents. The best application for this purpose, is a single drachm of ammon. muriat., dissolved in about four ounces of the liquor. ammon. acet.: linen, dipped in this solution, should be kept constantly wetted and applied to the part. There is no disease which practitioners, both ancient and modern, have differed so much as to the treatment of the radical cure; each perhaps had his particular favourite remedy, and which he did not like to give up for any new one brought forward. With some, after an opening had been made, it was customary to put in a *tent*, for the purpose of keeping the cavity distended until the adhesive inflammation took place; but this was not at all attended with success, as the tunica vaginalis fell into folds, so that only a partial adhesion took place, consequently the water was capable of continuing to increase between these folds. Another mode of treatment, and one strongly recommended by Mr. Pott, which of course influenced many others, was by *seton;* but this had evidently great disadvantages, on account of the violent irritation produced by it. There is only *one* state in which any kind of *ligature* is proper, and that is in very young subjects. Here many prefer the passing a small ligature to that of using the trocar, as from the small quantity of contained fluid, the latter instrument would be in great danger of wounding the testicle.

The method by ligature is this: pass a curved needle with the ligature through the integuments rather transversely, but sufficiently deep to pass through the upper part of the tunica vaginalis, and then left there; the time that it is to remain should be commonly eight or ten days. Another favourite mode was by *caustic,* and strongly supported by the late Mr. Else; but this is now generally exploded, as it was impossible to know when the tunic was burnt by it, so that very often only partial adhesions took place. The present treatment is a good deal more simplified, and the cure attended with much more certainty of success.

There are *two* modes only whereby the radical cure is to be accomplished. The *first* is by incision: the method is as follows: embrace the tumour with the left hand, then beginning the incision from the upper part, continue it downwards about three-fourths, leaving the tunic partially adhering in some parts; it then becomes necessary to introduce some extraneous body to excite some degree of inflammatory action, for which purpose a small quantity of flour may be used, and to be rubbed gently against the tunic.

The cure in this manner is not accomplished by means of adhesion, but by granulations, which fill up the whole of the cavity. There is one advantage attending this method of operating, and that is, that we are better acquainted with the state of the testicle; but there is evidently, on the other hand, one great objection against it, on account of the violent irritation and inflammation produced by it, and its being notwithstanding sometimes unsuccessful: therefore it becomes necessary to have a milder substitute, and this has been amply attained by the means proposed by Sir James Earle, and which certainly do him great credit; and although many lay claim to the priority of this treatment, it signifies not a straw what was done formerly, it was principally through Sir James Earle that this treatment was so generally adopted by the profession. When Dr. Harvey discovered the circulation of the blood, what was endeavoured to be done? why that it was no discovery at all, that it was known the Lord knows how many centuries before! When Dr. Jenner proposed the vaccine, many searched all the old manuscripts and publications to see if they could trace any hint that might be swelled out into something similar; so with respect to other discoveries. But this species of illiberality is truly contemptible, and ought to be banished from every generous mind. What ought to be looked to is this, who is it, that is the means of directing the public attention to such a remedy or treatment, which probably had been obsolete or never known at all? and any manifest improvement made, deviating from the regular routine of practice, is equally, in my opinion, as original, as if no hints had ever previously existed. What I have alluded to is the operation by INJECTION, which is not only the most simple, but the most certain method of obtaining the wished for success.

Before I proceed to detail the operation, it will be right to make a few observations. If the hydrocele be not transparent, as sometimes happens to be the case, it will be proper in the first case to make a small puncture with a lancet in the tunica vaginalis; by this means the exact nature of the disease will be better known, and if it should prove to be any other disease than that of hydrocele, this simple plan, invariably adopted when there is the least doubt whatever, will avoid many unpleasant consequences; in fact, as I have already stated, when this precaution has not been attended to, the most fatal effects have resulted from its neglect.

The instruments necessary for the operation, are a small and a large trocar; the former is preferable in the greater number of cases, and the latter should not be used unless the scrotum is a good deal thickened. The canula should be made so as to fit perfectly to the trocar, as otherwise the injection will not be thrown into the tunica vaginalis, but into the cellular membrane: an elastic bottle, capable of containing about four ounces of fluid, and having a stop-cock to it, is useful for this purpose. The solution most commonly made use of, is one drachm of the zinc. sulph., formerly vitr. alb., to aq. rosæ lbj., and this is considered preferable either to wine and water, used by Sir James Earle in the proportion of two-thirds of wine to one of water, or brandy and water used by others, as the precise strength of the two latter cannot be always exactly ascertained. When, however, Sir James's injection is used, I should think equal parts would not be too strong; and if brandy, and good, one part of it to five of water. The strength of the injection, however, must always depend upon the irritability of the patient's constitution. Having divided the integuments with a lancet, proceed exactly with the introduction of the trocar, as advised for the palliative treatment: and when the fluid is evacuated, throw in the injection into the tunica vaginalis. The time commonly allowed for it to remain, is from three to five minutes, according to the degree of pain excited, moving the scrotum from side to side, for the purpose of producing an equal irritation; when withdrawn, lint and adhesive plaster is all that is necessary. In introducing the trocar, care should be taken not to do it in a hurry, nor plunge it in suddenly, but keeping it obliquely upwards, and gently rolling the hand: the best part for making the puncture, is about two-thirds of the tumour downwards, remembering to let the trocar pass sufficiently deep into the tunic. When the water is evacuated, take hold of the scrotum, and the part of the vaginal tunic which is around the point of the canula, and then throw in your injection.

The first symptom that the patient feels, is a pain in the region of the kidneys, in the thigh also of the diseased side, in the groin, and at the neck of the bladder. The symptoms are so common, that the patient may be previously acquainted with them. The time that the injection is to remain has already been mentioned, but it will be necessary to observe, that if the patient should not be affected within the course of five or six minutes, it would be advisable to leave a small portion of the injection within the tunic, or in preference, let it exceed the time mentioned. A gradual degree of pain excited, will prove more certain of a cure than when inflammation is at first violent, as partial adhesions in the latter instance commonly take place. The first mark of cure is a redness of the scrotum, observable in about twenty-four hours. In forty-eight hours the scrotum will be as large as it was previous to the operation; but in elevating it, the weight will be much greater. This arises from the effusion of coagulable lymph, and if pressure be made at this time on any part of it, there will be a feeling in it, as in anasarca. The swelling in the course of a week diminishes, and in a fortnight will be still further reduced, if not entirely removed: but this must depend upon the degree of absorption.

Even this operation, as simple as it may appear to be, yet is not without its danger, of which three cases could be instanced: one was an old man who had the operation performed on him in Guy's Hospital; about two years after, he was again admitted, and it was done by a dresser, and in a proper manner, as he concluded; but during the operation, the patient appeared in excruciating pain; to relieve which, the dresser removed the elastic bottle, but was much surprised not to see any fluid return with it, neither was he able even by pressure to get out any of the injection, it having passed into the cellular membrane, *owing to the canula not properly fitting the trocar*, and the more he pressed, the more the injection passed towards the abdomen; the consequence was excessive inflammation, succeeded by mortification, which carried him off. If any surgeon should be thus circumstanced, I would advise the immediate enlargement of the orifice, and the injection of a large quantity of water, so as to dilute the first solution used, in order to take off in some measure its stimulating effect. But, in fact, this case proving fatal, was chiefly to be attributed to the dresser. There is danger ensuing from the injection when the tunica vaginalis communicates with the abdomen, and I would advise it by no means to be used where this exists, as it commonly does in young persons, as they may be treated in a much better way, which I shall notice: but if it be done at all, which I would not think at any time prudent, pressure must be made on the mouth of the tunic with an assistant's fingers, or otherwise peritoneal inflammation would take place; on which account, I should certainly prefer letting the disease alone, and treat the cure as hernia, that is, by putting on a truss on the mouth of the tunic, which will in the course of a few months close the communication by means of adhesion; and after the opening has been closed, the disease then becomes more simple, and may be treated by injection, if the patient be an adult, except its being also complicated with a tendency to dropsy, the symptoms of which it will be by all means desirable previously to remove. In young people I should not, from what I have seen, advise the injection, but merely make use of the stimulating applications already mentioned, or any others of a similar nature, and which will most commonly succeed. It has been objected to the operation by injection, that the state of the testicle cannot be accurately known; but this is easily answered, for if I were certain that the testicle was enlarged, this circumstance would be an additional inducement for its adoption, as many instances are known where the enlargement has very greatly diminished.

Instances have sometimes been seen of an hydrocele of the spermatic chord, and it is often liable to be confounded with the inguinal hernia, on account of its similarity in some of its leading symptoms; for when the patient is desired to cough, a dilatation, as in hernia, will be perceived; also on the patient's lying down, the tumour will disappear, and vice versa. Here it would be prudent to wait, and not hurry to operate, as the disease, although at first intricate, yet in the course of two or three years, or probably less, will be easily distinguished; it then gets very large and transparent, a circumstance which will set its nature in a *clear* point of view, and enable it to be distinguished from hernia.

Cysts occasionally are found on the external parts of the body: if transparent, which may be known by placing the patient in a dark room, and holding a lighted candle to the tumour, may be safely injected with success, of which many instances could be stated, but which would only enlarge this work, without being productive of utility.

LECTURE XV.

ON ANEURISM.

By aneurism, derived from the Greek *ανευρυνω*, to dilate, is meant a pulsating tumour in the situation of an artery, and proceeding in consequence of the coats of the artery *giving way* and *yielding* to the process of absorption. It is commonly divided into *three* states with respect to its symptoms. On examination in the *first* instance, a small tumour will be discovered, having a strong pulsation, the skin undiscoloured, and generally unattended with pain: on compressing the part above the tumour, the sac most commonly can be emptied of its contents; and this arises from the circulation of blood in the artery being stopped in its course towards the sac. In the *second* state, the tumour is solid, and of a firmer texture, and attended with a degree of shooting pain; the parts below very often become œdematous, and are heavy, cold and pulseless. If the tumour be compressed above, although the sac yields a little, yet it will still remain prominent. There is a throbbing pain felt in consequence of the blood rushing from the orifice of the artery to the aneurismal sac, and an unaccountable sensation of weight, pain and numbness through the limb; the circulation below the tumour is weak and feeble, and the limb is deprived of a portion of its heat until the anastomosing branches enlarge, and allow an increased portion of blood to flow through them. On dissecting, the artery below is found to be considerably smaller than above the tumour. In the *third* stage the skin becomes discoloured, having a reddish brown cast, the cuticle separates from the surface, and a desquamation takes place; under this there are commonly ulcerations.

The portion of skin so discoloured loses its vitality, and forms an eschar; the process by which an aneurism bursts, is by sloughing: a small quantity of blood is at first thrown out, and the eschar proceeds to separate further and further, till at last, from repeated hæmorrhages, the patient is exhausted: it rarely occurs, that it bursts so suddenly as to occasion immediate death. When sudden hæmorrhage has taken place, it is possible to protract the patient's life for a few days, by the application of a piece of lint to the part, over this, adhesive plaster, and properly secured by bandage: it does not always break externally, it having been known to break under the skin, producing ecchymosis, and ultimately death from mortification.

The *seats* of aneurism are various, and the symptoms are more or less violent and dangerous, according to the situation. When in the cavity of the chest, the following appearances present themselves: if above the heart, in the curvature of the aorta, it contracts adhesions to the pericardium, and bursting into this membrane, proves fatal, and in this seat of the disease there are few symptoms of aneurism apparent; the patient in moving quick or making any exertions, is affected with difficult respiration, and has an uneasy sensation in the scrobiculis cordis; these symptoms are often found in patients labouring under dyspepsia, so that there is scarcely any distinguishing mark of the disease.

The next seat is between the heart and the curvature of the aorta, but this is not very common; if it forms beyond the curvature, or what is then called the ascending aorta, it will prove fatal by its pressure upon the trachea and œsophagus, preventing ultimately the admission of air, as well as the power of deglutition, and this often before it has advanced very materially in size. When seated in the cavity of the abdomen, if above the superior or lesser curvature of the stomach, it occasions the rejection of every thing swallowed; if it forms in the beginning of the mesenteric artery, here its pressure is below the stomach, and the functions of the intestinal canal are not impeded; the situation and pulsation may be felt by placing the patient in an horizontal position, with his shoulders elevated, and making pressure with one hand on the abdomen. Aneurisms are sometimes seated in the abdomen, in the posterior part of the aorta, and pressing internally and laterally towards the spine and loins; here an aneurism may be easily mistaken for an abscess; an instance of this occurred in St. Thomas's Hospital, when the surgeon, taking it for an abscess, made an opening into it with a lancet, and immediately there was a sanious and bloody discharge: he being aware of his error, stopped the hæmorrhage directly with lint, bandage, &c.: other similar mistakes may be recorded. Aneurisms also occasionally form in the ischiatic notch, or under the gluteus maximus muscle.

When aneurism occurs in the limbs, its situation is most frequently opposite the joints, and the reason is, that in consequence of the frequent flexion and use of them, the blood is more likely to be interrupted in its course. Hence, on this principle it is, that popliteal aneurism ensues so frequently. Next to this, the inguinal is the most common. Aneurism of the carotids is not so commonly seen, and when it occurs, it is generally from pressure; thus it is that porters are so liable to it. That of the axillary artery, opposite the os humeri, generally proceeds from the same cause. Subclavian aneurism is rare, but very few examples have been seen, and their origin has not been so satisfactorily traced; hence, it may be justly said, it is seldom seen in these arteries. Instances have occurred of the internal pudendal artery, the posterior aural, and occipital arteries being subject to aneurism.

In some persons there appears to be a disposition to aneurism in different parts of the body, so that an operation in them is seldom attended with success, as the disease is liable to form in another part of the body.

With respect to the *prognosis* to be drawn in regard to the different situations of aneurism, they are most favourable when seated opposite to joints, still less so in the thigh, but the most unfavourable of all, when in the aorta; the reason is, that the former most frequently proceed from mechanical causes, and not, as in the latter, (though this is not always the case) from any previous disposition in the body, from imperfect structure, to the formation of them; but however favourable the prognosis might be, aneurisms are by no means to be neglected, as they are always to be considered dangerous from whatever cause they may arise.

THEIR MODE OF FORMATION.—The appearances that aneurism presents before the parts yield, are these: the coats of the artery are much thickened, of a yellowish hue, and opake, as if they had been subject to an inflammatory action from an injury, or disease, by which they become weakened; the thickness, with its opacity, is owing to the lymph thrown out; the part is commonly tender to the touch, and easily broken down by pressure. After this a process of absorption commences opposite to where the opake spot is, coagulable lymph is effused, and the circulating blood pushes this before it. Hence, the sac in aneurism is formed by the facial sheath on its outside, and by the coagulable lymph on its inside. As it increases in size the sheath becomes absorbed, the coagulable lymph soon yields, and the aneurism forms a sac with whatever is next in contact, till it reaches the skin, and through which it ultimately bursts; hence it would appear, that aneurism is *not the result of the yielding of the coats* of an artery, but *from the absorption*. If the artery be seated near a bone, it would appear that the whole circumference of the tube is not equally absorbed, and the expansion of the tumour is confined more to one side; in other cases the expansion is more uniform. Professor Scarpa, who has made some very valuable observations on this disease, and from the great opportunities which he had of prosecuting the subject, and his minute and accurate dissections, states, that in every case of *true* aneurism (and to these only I confine my present writing) the rupture of the proper coats of the artery was clearly evident. A very prevalent opinion existed, that every tumour of this description was actually occasioned by the dilatation of the coats of the artery; but from accurate observations, this has been found erroneous. Others thought that the two inner coats only were ruptured, and the external, conjointly with the sheath, formed the sac, or pouch. Aneurisms appear to arise from any sudden exertion, violent shock or contusion, so that the arterial parietes are weakened and disorganized; or by increasing the lateral impulse of the fluid against the sides of the vessel; but I deem these to be both essential to their formation. Aneurisms most commonly occur between the ages of thirty and forty; rarely in the young, or very old subjects: most frequently in irritable habits and those who are addicted to debauchery and dissipation; they mostly increase gradually, and enlarge where the least resistance is opposed.

To distinguish this disease from others, it is necessary to attend to the following discriminating remarks: when a tumour is seated over an artery, and the pulsation is as strong as that of aneurism, it becomes then highly necessary to be positive with respect to the nature of the disease, and for this purpose the tumour is to be elevated as much as possible; if it be an aneurism, the parts so raised continue to pulsate, and vice versa; however there is another better and more discriminating mode than this; suppose, for example, the pulsating tumour is situated on the thigh, in the course of the femoral artery, make strong pressure in the groin, on the artery of that side, to interrupt the flow of blood into that part; the aneurismal tumour, if it be one, will be immediately emptied, and sink down, and on removing the pressure, it will again suddenly regain its former size: whereas, if it be not an aneurism, the tumour will by no means be diminished. The artery sometimes lies anterior to the tumour; when this happens, feel only for the sides of the tumour; and if there be any pulsation, it may safely be concluded to be an aneurism, and vice versa, for in the latter case the pulsation will only be found in the direction of the artery.

Aneurisms, as far as I can trace, occur less frequently in women than in men. They sometimes, though but very rarely, undergo a spontaneous cure, of which two instances could be stated; and where an operation may be deemed improper from certain existing circumstances, it may be agreeable and advisable to let the patient know this; but otherwise it would be highly improper to inform him of it, as prejudicing his mind against an operation from which alone he can derive any benefit. It is possible that if the aneurism be of that nature as to prevent an operation from its situation, still the patient's life may be considerably prolonged by a strict attention to a spare diet, as milk, broth, and acidulated drinks, &c., the occasional use of digitalis; in applying repellent lotions to the tumour, as ice, or vinegar and water: bleedings should be largely and repeatedly had recourse to: recommended by Valsalva, and successfully adopted at the Hotel Dieu, Paris, by Pellatan; avoiding every stimulus or exertion, and observing perfect quiet and rest.

If the tumour be so small, and can be compressed, it will be prudent to have recourse to pressure by means of a pad, composed of somewhat yielding materials, accurately secured on the seat of the tumour, (having previous to its application emptied the sac of its contents) and support it firmly in this situation by means of a bandage, properly applied; if this should prove unsuccessful, it will be necessary to operate.

Of the old Method of performing the Operation.

Supposing the aneurism to be popliteal, the old method was thus: a tourniquet was to be applied in the same direction as in amputation, an incision was to be made into the ham from the upper to the lower part of the tumour, which was completely to be exposed; the clot of blood which the aneurism contained, was removed from the sac, and the orifice of the artery, being marked by momentarily loosening the tourniquet, it was again to be fixed, a probe was passed into the upper orifice of the artery, and an incision being made on each side of it, a needle and ligature was passed about an inch on each side of the vessel, and firmly tied, and the tourniquet again slackened: the place where the blood flowed from the lower orifice was marked, and an incision and ligature made on it as above: the blood in the tumour was generally of a venous colour.

This operation was seldom attended with success, so little so, as to deter surgeons very often from performing it; several unpleasant circumstances resulting from its adoption, as violent inflammation being brought on from such an immense cavity being exposed (as it appears from subsequent experience unnecessarily), and independently of this, the chances were that an exfoliation of bone would take place, so as to produce a stiffness in the limb: these disagreeable circumstances attending the old method of operating, induced the late John Hunter to make trial of a new mode, which I consider undoubtedly quite *original:* notwithstanding the priority of this, as well as every other improvement, has been contested by succeeding writers, as being known by the most ancient surgeons from some obscure passage that had sunk into oblivion many centuries before their day. The French jealousy is more pardonable, when the foibles of that nation are considered, and I take this opportunity of stating my belief, that the greatest blemish in D. J. Larrey's work, is his unwarrantable boasting, that the French surgical practice was so pre-eminently superior to the English: as this does not apparently to me exist, I think it might have been omitted. I believe it will be allowed by all those who had the honour of knowing John Hunter, that he entertained no great predilection for the ancient writings, neither was he at all aware that any similar plan had been previously adopted: from manuscripts I have by me, it would appear to be the result of numerous experiments made by him, from reflections on this subject, to ascertain the probability of a substitute for the old mode, but which, with all due deference for his great abilities, he states himself, with his usual characteristic candour, he was led, originally, merely by accident to pursue. He performed the operation at various times, and with great success, and it was deservedly considered as one of the greatest improvements made by him in surgery.

The first operation was done on a coachman, in St. George's Hospital, in the month of December, 1785; a broad double ligature was used, and with an eyed probe put under the vessel, it was then cut, and made two separate ones—they were tied, but with that force only as merely to bring the sides of the vessel together; two other ligatures were similarly applied on the vessel lower down, and these were tied; the ligatures were left hanging out of the wound, and union attempted by adhesion: on the fourth day, the wound was healed, except where the ligatures remained: on the ninth, a tourniquet was applied, as a considerable discharge of blood took place from the ligatures ulcerating through the artery: on the fifteenth, some of them came away, and also matter; the wound healed, and some time afterwards the remainder of the ligatures formed abscesses and were discharged, the tumour gradually became less, until it was entirely removed: he died in rather more than two years afterwards, when an opportunity was afforded of dissecting the diseased part; the femoral artery was imperforate from the arteria profunda down to the ligatures, and an ossification had taken place for nearly two inches—below the ligatures the vessel was open till it came to the sac, when it was again closed;—the lower opening from the sac was completely obliterated. In the second case, an attempt was made to heal the wound by granulations, but this was not successful; hence he determined to make use of but one ligature, and unite the wound by adhesion.

This practice was much more preferable than the old method, for two obvious reasons, independent of its simplicity; first, the artery where the incision is now made, was not, or if any, very little diseased; and secondly, its easy access. A broad ligature was at first made use of, and continued for some time, on the supposition that the parts would not be so liable to ulcerate; but on dissection, the reverse of this was observed. The principle by which an artery heals after the application of a ligature, has been ably and ingeniously explained by Dr. Jones, in his admirable work on hæmorrhage, the result of a numerous series of experiments on animals. He says, that for an artery to unite, it is absolutely necessary that its internal and middle should be ruptured, and this is only to be accomplished by a *round and very firm ligature*, drawn moderately tight on the vessel; the inner coats become united by adhesion before the process of ulceration separates the ligature round the outer coat: a broad ligature he found not to have this desirable effect. Dr. Jones proceeds further to observe, that the ligature may be taken away after the rupture, and division of the inner coats has been effected, and yet the artery will unite by the adhesive inflammation, glueing its sides together: this, in my humble opinion, is a *most important fact* ascertained, and tends greatly to simplify the operation for aneurism, as no impediment whatever would impede the healing the wound immediately. Mr. Abernethy made an improvement in this operation, which has been very successful: it is, applying two ligatures on the artery, about an inch asunder, and dividing the vessel between both. I think it but fair, however, to state, that many cases have done well without this division; but future experience will prove the advantages of both more fully. In case no hæmorrhage follows, which I conceive would depend materially on the proper use and application of the ligature, *one* only will do. Dr. Jones's plan may be sufficient, as it effects every intention that could be desired, a permanent interruption of the flow of blood to the tumour.

The operation for popliteal aneurism, as practised now, is commonly attended with success, and I recollect only two cases where it failed: in the one, from mortification, in consequence of an ossification of the arteries; in the other, from violent constitutional irritation.

The new Mode of operating for popliteal Aneurism.

It will be proper, previous to its adoption, to prepare the patient in some measure for it. In case he is of a full plethoric habit, the taking away blood will be beneficial; if not so, at all events it will be right to open his bowels with some brisk purgative. Place the patient in an horizontal position, on a table three feet high; his legs are to be kept in a relaxed state, that is, his knees bent, and his heels brought towards the other leg, so as to form an angle with the body; the reason for this position is obvious: if the limb were extended, the Sartorius muscle would completely exclude the possibility of easily getting at the artery; the surgeon is to be seated on the left side of his patient in an elevated chair;—there are four incisions necessary: the first is to be made on the anterior and inner part of the thigh, beginning one-third downwards from the spinous process of the ilium to the knee, and continuing it in the direction of the femoral artery four inches in length, which would completely expose the inner edge at the Sartorius muscle. The surgeon is then to press his finger into the opening, and cutting along the edge of the muscle, to draw it outwards, which will then expose the fascial sheath, enveloping the femoral artery, vein and branch of the crural nerve. The next incision is to be carefully made about an inch in length, through this sheath, which covers the femoral vessels.

The exact anatomical derivation of this fascia, as originally made manifest by Mr. Astley Cooper, will be explained when treating on femoral hernia. The artery will be found exterior to the vein, and a septum between them, which must be separated;—the vein is on the inside, the artery in the middle, and the nerve to the outside of the artery. It will, in this stage, be proper to lay aside the scalpel for the present, and take a director, which must be moved gently from side to side till it is easily insinuated under the artery; then withdrawing it, pass a flattened probe under the vessel with two ligatures, secure the uppermost immediately, then separate the artery below from the cellular membrane, connecting it to the sheath, in order to secure the second ligature, about one inch asunder from the uppermost; the artery, thus secured, is to be lifted up, and divided midway between the two ligatures with a probe-pointed bistoury; as soon as this is done, the parts are to be brought together by means of adhesive plaster; care should of course be taken by no means to include the nerve in the ligatures, which will be directly known by the degree of pain excited, and which extends up to the crural nerve; it will be known also from the numbness that ultimately takes place in the limb. The limb must be kept moderately warm, and which may be done by a woollen stocking drawn over it. It may be prudent to take away blood after the operation, but this will depend upon circumstances, which must be left entirely to the discretion of the operator;—the bowels are to be kept gently open. The ligatures commonly separate and come away, from the twelfth, to the thirteenth or fourteenth day; they are sometimes protracted to even the twentieth; at all events do not mention any stated time to the patient, as should he be deceived, it might make him restless and uneasy.

The securing the femoral artery, as detailed above, will be also applicable to aneurisms in the anterior and posterior tibial arteries, of which some few instances have been seen; the reason is, that the anastomosis is so free between these three, that there would still be a communication with the aneurismal sac if either the tibial arteries were secured, and would not answer except the interruption was complete, therefore the femoral artery being the principal medium through which the sac constantly receives its supply of blood, the cutting off this communication must naturally be more preferable, and likely to be attended with the desired success.

OF FEMORAL ANEURISM HIGH UP.

The sac commences below Poupart's ligament, between the arteria profunda, and the edge of the above ligament. The pulsation is commonly very strong;—the ligament just mentioned, forms a boundary above the aneurism, and the artery superior to this is sound; hence there becomes a necessity for securing the external iliac artery.

The *first* person who performed the operation for taking up this artery, and to whom the profession is much indebted, although the operation, as might be expected, was capable of improvement, yet was deserving of great merit, as the operation was new and certainly original;—it is to Mr. John Abernethy, of St. Bartholomew's Hospital, that I allude, and it must be extremely grateful to his feelings, to have found it so very successful; the judgment and boldness which prompted him to the trial, and the ease and simplicity with which he secured the vessel, were so many proofs of his discernment and anatomical knowledge; our neighbours were incredulous, and they doubted and hesitated, disbelieving what has since been so repeatedly demonstrated practicable; in the first case, one ligature was used, and no division made: in the two succeeding, two ligatures were employed, and the artery divided. Mr. Freer, of Birmingham, and Mr. Tomlinson, used but *one ligature*, and no division, and both were successful. Mr. Astley Cooper has since repeatedly and successfully operated on this vessel, in some cases even where the aneurismal sac was in a sloughy state, and having an eschar formed on it, which I perfectly recollect witnessing, where, if it had not been speedily adopted, the patients would inevitably have soon died. Some few unsuccessful instances have occurred, and one I remember, which happened to Mr. Cooper, where a ligature was applied *below* Poupart's ligament, between it and the arteria profunda: in fourteen days after the man died of hæmorrhage, from which it would appear, that if a ligature be made near a considerable branch, as was the case in this instance, it prevents adhesion taking place, in consequence of the flow of blood washing away the adhesive matter.

THE MODE OF OPERATING.

Mr. Abernethy operates thus:—an incision, three inches in length, is to be made through the integuments of the abdomen, commencing a little above Poupart's ligament, and extending it upwards; it is to be rather exceeding half an inch to the outer side of the abdominal ring, to avoid, by so doing, the epigastric artery; thus the fascia, or aponeurosis of the external oblique is exposed—this is to be divided in a similar direction—hence comes into view the internal oblique—the finger is now to be introduced below the inferior margin of it and the transversalis, which are to be divided with a crooked bistoury, to the extent of an inch and a half: two fingers are to be introduced beneath the peritoneum, which are carried upwards by the side of the psoas muscle, so as to touch the artery about two inches above Poupart's ligament; the pulsations of the artery make it easily distinguishable; a slight incision is obliged to be made on each side, to detach it from its fascia, so as to allow one finger to be inserted under it: with an eyed probe two ligatures were conveyed under it, one was secured upwards, as high as the artery was detached, the other some distance lower down, and the vessel divided midway between each:—the wound to be attempted to be united by adhesion.

Mr. Astley Cooper operates somewhat different: he recommends the incision to be made above the abdominal ring, in a *semilunar form* (thus deviating from the custom of making it parallel with the direction of the artery), carrying it in the direction of Poupart's ligament, which will serve as a guide, within an inch and a half of the spine of the ilium; this will expose the tendon of the obliquus externus: then carry the knife above the ligament, so as to expose the obliquus internus; laying aside the knife for the present, the fingers are to be passed beneath the spermatic chord, and under it is the situation of the artery: it is very necessary to separate distinctly the artery from the surrounding substance, which runs on the inner side of the former: the best method is by means of a director, which by moving it a little from side to side may easily be insinuated under the artery, which is then to be secured in the same manner as described in the operation for popliteal aneurism.

Case.—A robust Swede, thirty-five years of age, was admitted into St. Bartholomew's Hospital, in February, 1809, with an aneurism of the femoral artery, immediately below Poupart's ligament. The external iliac artery was tied by Mr. Abernethy; two *broad* ligatures were applied very tightly to the vessel, but it was not divided; both came away on the tenth day, and the wound healed soon afterwards. The tumour, which at the time of the operation was as large as a lemon, became absorbed.

Case.—The subject of an aneurism, operated on in June, 1808, by securing the external iliac artery, by Mr. Astley Cooper, has been perfectly successful; he walked with considerable ease, with the aid of a stick, and accomplished a walk of three quarters of a mile at one time, at the end of less than six months. He made no complaint of coldness in the limb. The event of this case is the more gratifying, as the man did not see Mr. Cooper until the tumour, which was very large, was actually livid; and the operation could not have been postponed without considerable risk: in proof, it may be added, on the sixth day following the sac burst, and discharged its contents.

SECURING THE CAROTID ARTERY.—It is necessary here to observe, that an aneurism of the arch of the aorta, may and has been mistaken for a carotid aneurism. Allan Burns has stated, that this was first remarked by Mr. Astley Cooper, the appearance it assumes being somewhat similar. I do not remember, as far as my recollection serves me, of the carotid artery being successfully tied till June, 1808, by Mr. Astley Cooper. The patient was a man, aged fifty: he came into Guy's Hospital with a carotid aneurism, occasioning throbbing in the brain, and great pain on one side of the head, giddiness, hoarseness, cough, slight difficulty of breathing, sickness, &c. The swelling appeared to be near the acute angle made by the bifurcation of the common carotid, on the left side, under the angle of the jaw. The operation was attended with perfect success.

This case is highly valuable, inasmuch as it is hitherto the only one which, as far as I know, the credit and character of the operation is supported—I mean its character in a medical sense.

The practicability of the safe application and removal of the ligature, was put beyond doubt by the event of his first operation for the disease, some time previously, on Friday, November 1st, 1805, on Mary Edwards, aged 44. The aneurism was seated on the right carotid artery. On the twelfth the ligatures came away—on the twenty-first she died, and on dissection the aneurismal sac was found increased in size, highly inflamed, and containing a quantity of pus. Humphries, whose occupation was that of a porter, the subject of the former operation, resided afterwards in Labour-in-Vain Court, Old Fish Street; he was quite well, and returned to his usual employment. The facial and temporal arteries of the corresponding side had no susceptible pulsation; on the opposite side, the temporal artery was larger than usual. The tumour totally disappeared; his intellect was perfect, his nervous system unaffected, and the very severe pain which he endured upon the same side of the head, previous to the operation, he has never experienced since; a hoarseness which he had prior, continued, though it was not then so much as it had been. Mr. Benjamin Travers tied the carotid artery in a woman, who laboured under an aneurism by anastomosis in the left orbit, by which the eye had been protruded from its socket, accompanied by distracting head-achs: *two small round* ligatures were applied, but the artery was *not* divided; they separated on the twenty-first and twenty-second day, without hæmorrhage, or any alteration in the functions of the brain, and the tumour was absorbed: the effect of the ligatures, upon the artery, coincided with Mr. Cooper's successful operation.

These two operations put the practicability of the operation being performed with success beyond the shadow of a doubt, and to render success more certain, it would be advisable to adopt it early, before the tumour has increased to any considerable size, so as to affect the œsophagus or trachea.

MODE OF OPERATING.—An incision is to be made opposite the centre of the thyroid cartilage, to within one inch of the clavicle, on the inner side of the stemo-cleido-mastoideus; having exposed this muscle, turn the margin of it aside, and then the omo hyoideus comes into view, crossing the sheath of the vessels, and also the descendens noni: in separating the stemo-cleido-mastoideus from the omo hyoideus, the jugular vein is seen; the vacillating motion of this vessel, which is increased in respiration (so that without care it will be liable to be wounded), presents the greatest difficulty in the operation—a finger is to be introduced into the wound, to keep the vein out of the way, under which lies the carotid artery. It is of the greatest consequence, not to injure or include the par vagum, which is situated immediately between the vein and artery, a little to the outer side of the latter, as such a mistake would prove fatal, and also the recurrent nerve, which is attached to the artery; a blunt iron probe was used to convey a double ligature under the artery: the lower one was first secured, the artery was then detached about an inch in length, and the upper ligature applied: in the unsuccessful case the artery was left undivided, in the successful one it was cut through, mid-way between the two ligatures: the wound is to be closed with adhesive plaster.

An opinion formerly prevailed, that the tying of the carotid artery was always succeeded by stupor, sleepiness, &c.; but this requires very little to refute it, as the fallacy of such opinions has been demonstrated. When both carotids are tied, the circulation must be carried on by means of the superior and inferior thyroideal and vertebral arteries: I have never heard this attempted on the human subject.

In operating for aneurism on the *scalp*, supposing it to be in the posterior aural artery, it is generally necessary to tie the artery, passing into the sac, as well as that leading out of it, on account of the free anastomosis.

SECURING THE SUBCLAVIAN ARTERY.—In a true aneurism of the axillary artery, that is, a very well marked one, wherein the clavicle is much elevated, the operation is very difficult; but under the common circumstances of aneurism, where the clavicle is in its situation, it is by no means so: it here becomes necessary to tie the subclavian artery, and to do so, an incision is to be made, beginning about an inch and a half from the sternal end, and continue it to the same distance from the scapular end of the clavicle, so as to make the middle of this bone the centre of your incision: the internal jugular vein will be discovered in the middle of this cut, and underneath, the axillary plexus of nerves, lying above the artery, which will be found emerging from the chest, between the scaleni muscles. There is considerable difficulty in the passage of a ligature under the artery, and in separating it from the nerves; and many very ingenious instruments have been invented for this purpose; a curved eye-probe probably may do as well as any. Great care must be taken to avoid including any of the cervical nerves; and if the operation is done on the left side, be aware not to wound or include the thoracic duct, as it would soon prove fatal. One ligature, properly applied, appears to be sufficient, and there will be no necessity to divide the vessel.

To secure the axillary artery *below* the clavicle, the following operation is necessary, which has been performed successfully by Mr. Keate. The tumour had burst, and the artery was compressed against the first rib—an incision was made obliquely downwards, below the clavicle, the fibres of the pectoral muscle were divided, and when he came to the artery he passed a curved blunt-pointed silver needle, doubly armed, as he thought, under the artery, and tied two of the ends; as the artery still pulsated below the ligature, another was passed more deeply, higher up, nearer to the clavicle, and tied. Mr. Charles Bell, in his System of Operative Surgery, details a more easy method, but very similar: the incision is to commence about an inch from the sternal end of the clavicle, in a direction towards the acromion, the direction to be a little downwards, from a line parallel to the clavicle—here the fibres of the pectoral muscle are exposed, which are to be divided: underneath is some cellular substance, which is to be carefully elevated with a pair of forceps and cut; this will bring into view the subclavian vein, and cephalic vein uniting with it; under the subclavian vein, and a little backwards, more under the clavicle, the artery may be felt and tied. Another method is this: an incision, to the extent of three inches, is to be made below the clavicle, over the space between the deltoid and pectoral muscles, which will expose the axillary vein, situated anterior to the artery, and which latter vessel is lying among the cervical nerves: great care must be taken not to wound the vein, or include a nerve in the ligature; having passed a ligature under the artery, detach it completely from the nerves—one ligature will be here only necessary, and no division required.

Securing the Brachial Artery.—A varicose or venous aneurism, a circumscribed or diffused aneurism, may be thus distinguished: *the first* is generally the result of bleeding with a lancet, by which a tumour is formed, from the effusion of blood into the adjacent vein; it is denoted by a kind of tremulous motion in the vein, and by a peculiar hissing sound;

the swelling will not be less by compressing the vein below; but if pressure be made on the artery, it will almost entirely disappear. I saw a married woman, who had been thus injured by a country operator; a tumour had formed, which alarmed her a good deal; it had, however, by constant pressure, at the time I saw it last, almost disappeared.

A circumscribed or diffused aneurism is from a wound of an artery only, by which the blood is effused into the cellular membrane; it has also been named a false aneurism; it happens thus:—I shall say, for instance, the brachial artery is wounded, and the wound being small, an attempt is made by pressure to close it; but not being applied in such a way as totally to obstruct the escape of blood, an effusion takes place into the adjoining cellular membrane.

This last disease may require the brachial artery to be secured in a similar manner to that of an aneurism forming from absorption of the coats of the artery: the vessel is very readily found on the inner edge of the biceps, the artery is accompanied by the median vein and nerve, and care must be taken not to secure either in the ligature; one ligature is sufficient, and no division necessary: merely securing the vessel above, or at some little distance from the tumour, will be amply sufficient.

In an aneurism of the ulnar artery, high up, it will be necessary to secure the brachial; if at the wrist, probably opening the sac, and making a ligature on the ulnar artery above and below, would be most proper.

LECTURE XVI.

ON CATARACT.

CATARACT is derived from καταρασσω, to confound, or disturb, because the sense of vision is confounded, if not destroyed: it means an opacity of the crystalline lens, that obscures the sight. There are *two kinds* of cataract, the one termed the *crystalline*, the other the *capsular;* the former when the humour alone is affected, the latter when its capsule is: these are often found both to be combined in the same subject. At the commencement, the patient complains of an indistinctness in vision, as if a cloud hung over his eyes, or the objects were enveloped in a mist; he observes a body floating before him: this latter symptom sometimes occurs when there is no cataract, as in an affection of the optic nerve, but it may be distinguished from this disease by these circumstances; when the nerve is affected *several* bodies are observed floating before the eyes, but *not fixed,* so that they continually appear to be *in motion;* whereas, in cataract, it is only *a single* body, and *stationary:* as the disorder advances, objects become very indistinct in a glaring light, from the contraction of the pupil; but in the shade, from the enlargement and dilatation of the pupil, they become more obvious: as it continues to increase, although ultimately vision is perfectly obscured from discerning objects, the rays of light are not altogether prevented from passing to the retina, so that if a hand be placed between the patient's eye and a candle, he will be able to know that there is a something before him, though he cannot describe what it is. When on trial this is found not to be the case, it may fairly be suspected to be complicated with *gutta serena.* In the progress of the disease, previous to its being so matured, the imperfect vision, if I may so term it, is more or less according to the strong or weak action of the rays of light, as I have above remarked, and it is on this account that the vision, partially obscured as it is, yet is rendered better in the evening, the rays of light then proceeding from that luminous body, the sun, being much weaker, and consequently the pupil is more dilated.

A cataract appears as a speck or spot in the lens, through the pupil in the first instance becoming gradually enlarged, till the whole of it appears through the aperture to be of a whitish colour, as vision becomes insensibly lessened and diminished, but is not altogether obscured. Occasionally it is found of a greyish cast, and at other times remarkably white, and apparently opaque, resembling a pearl, or the eye of a fish boiled. The crystalline humour, when converted into a cataract, is most commonly white, but not invariably so, as it is sometimes of a yellow, and also of a reddish brown colour, which latter appearance renders the disease obscure. In adults it is mostly, but not always, of a solid texture throughout: it has occasionally been found in a fluid state, at other times a mixture of both, and when removed in the operation the fluid part escapes first: the distinguishing marks, whether it is solid or fluid, are, that when the latter happens, it is of a *perfect uniform colour*, and when the former, it has a *radiated* and *streaky* appearance; there is considerable advantage in knowing this, because the respective operations for each are different. It is very rare, indeed, that the crystalline lens has been seen ossified, and I recollect to have heard mentioned of but one instance having been so seen. If the lens be hard and opaque, it is termed a *firm hard* cataract, if fluid a *milky* cataract, and if of the consistence of jelly a *soft* cataract. The capsule itself is sometimes opaque, as well as the lens; to distinguish it, it is only necessary to observe attentively the close connexion between the pupil and the cataract, the iris resting on the latter: sometimes the capsule adheres to the edges of the iris, and in this case the operation is very unsuccessful: an easy way of knowing when this has taken place, is by introducing a small portion of the extract of belladonna (deadly nightshade), with a camel hair brush on the eye, over which it very soon spreads, if there are no adhesions, and the pupil is perfectly distinct, which will be known by its motion being free and prompt; it will be observed very much dilated, in consequence of the contraction of the iris.

The cataract is sometimes loose and floating in the eye, and having an opacity: in this case it would appear, that the tunica transversalis, the connecting membrane between the crystalline and vitreous humours, becomes absorbed, and in the operation here it will be necessary to make use of a scoop. I had some years ago a very excellent opportunity of witnessing the progress of this disease from its infancy, in Mrs. Baskerville, the lady whose case I have introduced on the subject of burns and scalds: she had a cataract in both eyes: I recollect her sight as perfect as any person's, and I remember the gradual loss of vision, which she attributed to her anxiety in getting some very fine and delicate needle-work completed, and which she thought tended to weaken her sight very much. At her request, I very often examined her eyes, and was satisfied in my mind there was every probability of success to be expected from an operation. I strongly advised her to undertake the journey to town, and place herself under Mr. Wathen Phipps. She did so; he couched her, and she recovered her sight, which she retains to the present moment.

The cause giving rise to the formation of cataract is not well understood: it has generally been supposed to originate from an inflammatory action of the parts, but this is not always the case; I do not mean to affirm it is never so, for the contrary is well known; there is no marked sign of the presence of inflammation at the commencement of the disease, and seldom any pain accompanying it. It appears no age is exempt from cataract, as it is seen in children and in old age; but the most prevalent age is in the decline of life, that is, after forty. If it suddenly forms from a severe injury, it recovers its transparency without any operation being necessary.

Treatment.

Mr. Ware, who has had extensive practice, and written on this subject, advises the application of ether to the eye, to the extent of a drop or two, once or twice daily, in the incipient state, rubbing occasionally the eye, over the lid, with the point of the finger, having a mercurial liniment on it: the hydrargyri muriatus in small doses has been found very serviceable, and also the submuriate; electricity has been recommended.

OPERATION FOR THE CATARACT.

The operation is commonly divided into two kinds, but properly speaking, there are three. The *first* is by *extraction*, or removal of the crystalline lens, by a semicircular incision being made through the transparent cornea: the *second* is that of *couching* or *depression* of the lens into the vitreous humour: the *third* is by *puncturing* the capsule of the crystalline humour, so as to allow of the discharge of the lens into the anterior chamber of the eye.

MODE BY EXTRACTION.—It is necessary to keep in mind, that there is much danger to be apprehended from the ensuing inflammation, and therefore the patient must be prepared, in some degree, by purgative medicines, and even by bleeding, if the patient be of a robust and plethoric habit. But the best method that I am acquainted with, and that adopted by the most celebrated oculists, for preparing the patient for the operation, and from which he will derive considerable benefit, is this; to draw a probe, a few days previous to the operation, across the eye, over the cornea, and to repeat this plan twice daily; this will, at first, from its irritation, excite, as might naturally be expected, considerable pain, which will gradually diminish after a few days' use: it will have this effect—the patient will be less liable, after the operation, to excessive constitutional irritation, from his having been thus habituated gradually to an irritant. The light for operating must not be too strong, and it should fall obliquely on the eye, not direct. In fixing the patient, care must be taken that the light does not fall on that part of the eye where the knife is to be directed, and let the chair, which should be a low one, be placed with a degree of obliquity towards the window. The oculist is to be seated on a high chair, rather on one side of the patient, so as to rest his foot upon the side of the patient's chair, with his arm resting upon his knee, and his hand on the patient's temple. The patient's head is to be supported by a pillow. The assistant is to place himself behind the patient's chair, having a handkerchief to cover the sound eye in his hand, and with the other he is to press the eyelid against the orbit firmly, taking great care that the lid does not slip, which would totally prevent the operation, therefore his fingers should be very dry. The necessary instruments are, a lancet-shaped knife, of a wedge form, gradually diminishing from the handle to the point; this is nearly in the shape of Wenzel's knife; the length is an inch and a half, and a quarter of an inch at its widest place, gradually tapering to a point. Mr. Ware's knife is less spear-pointed, increasing in thickness from the point to the handle, and this former he maintains will prevent the discharge of the aqueous humour, before the puncture is completed, when there will be less danger of wounding the iris. A tenaculum will be required, to scratch the capsule of the lens; a silver scoop, to extract the solid parts, if any; a pair of delicate forceps, for taking away any part of the capsular membrane. A speculum was also formerly used to fix the eye, but its use has been long discontinued. Wenzel and Ware both coincide in this respect; the pressure occasioned by all these contrivances, for fixing the eye, is a serious objection, as it is very apt to cause a sudden protrusion, and consequently loss of a great part of the vitreous humour. It will be right to observe, in some children Mr. Ware has been obliged to use these mechanical instruments; what he used was merely an oval ring. The only method, and which was long kept a profound secret, of fixing the eye, is with the fore finger placed in the inner canthus. The operator is to take the knife in his right hand, if the left eye is to be operated on; and in the left hand, if the right eye; holding it like a pen in writing, his hand resting on the outer side of the eye, with the little finger on the edge of the orbit, separated from the others: the knife is to be passed into the eye, an hair's breadth anterior to the junction of the transparent cornea with the opaque, or, as Wenzel says, at the upper and outer part of the cornea, a quarter of a line distant from the sclerotica, in such a direction that it may pass obliquely from above downwards, parallel to the plane of the iris. Wenzel does not commence till the eye is perfectly quiet, and turned towards the outward angle, but avoids all pressure on the eyeball. To this Mr. Ware very justly, in my opinion, dissents; he recommends the operator to fix the eye with the fore and middle finger of the left hand, placed upon the tunica conjunctiva, just below, on the *inside* of the cornea, while an assistant places his finger in apposition, on the inside and above the cornea. Mr. Ware advises the knife to enter the outside of the cornea, a little above its transverse diameter, and at the same distance from its connexion with the sclerotica, as Wenzel and others approve of; the knife is to be pushed on slowly and steadily, in a straight direction, with its blade parallel to the iris, till it pierces the cornea at the *inner angle of the eye, opposite to that which it first entered;* all pressure is to be removed; the aqueous humour will now be evacuated, and the eye becomes placid, and the knife is to cut its way out by pressing it downwards, making a semicircular division of the cornea at the lower part of the eye.

In Wenzel's mode of operating, to shew his dexterity, rather than with any other motive, when the knife got opposite to the pupil, he inclined it backwards, and thus punctured the lens; but Mr. Ware very properly objects to this, for the danger of wounding the iris is very great. The obliquity of the incision countenanced by Wenzel, who was an extremely expert oculist, is not followed by any of our best English operators; they think the advantages which he states are not of that importance as to warrant imitating it:—neither is it prudent to attempt the wounding of the capsule at the same time: it is thought better and equally as effectually done with a tenaculum, with the back turned towards the humour in the first place, then afterwards turning its point towards it, the capsule is to be scratched with it, and by using gentle pressure on the eye, the lens immediately escapes.

The only parts divided in this operation are the transparent cornea, and the capsule of the lens, which allows the lens to escape, as well as the aqueous humour. When the operation is finished, if the iris projects below the flap, which is made by the knife in the cornea, passing a scoop under it, will succeed in getting it into its place: if there are any solid portions of the lens remaining, they are to be removed with a scoop. The eyelids are to be closed immediately, by which the edges of the flap are brought into contact, then apply a piece of lint, dipped in the liq. acet. plumb. dil., or weak brandy and water, and, according to Mr. Ware, a pledget of spermaceti ointment over it, and over this a roller, which should, in the first instance, be applied rather loosely: the patient is to be put to bed with his head somewhat elevated, and he is to be particularly cautioned against opening his eyelids. All kinds of stimuli are to be avoided, therefore the room should be darkened, and light entirely excluded, and the less conversation the better; and he should, if possible, avoid going for some time to stool, hence the necessity of opening the bowels previously. His diet is to be of a light nature, and in fact the antiphlogistic plan strictly adhered to. If inflammation be at first violent, it will be right to apply leeches, and if it should not abate soon, it will then be proper to bleed freely from the arm, or, what is still better, to open the jugular vein or temporal artery. The patient should lie continually *on his back*, after the operation has been performed, as in this position the humours are not so liable to escape. The eye is often opaque afterwards, from the great inflammation which ensues; hence when this exists recourse must be had to vene-sectio, to moderate its violence. Pus likewise occasionally forms. The operation has sometimes failed, from want of due attention, in the first instance, to the state of the optic nerve; should it be diseased, the operation will be utterly useless.

Difficulties to be encountered.—When the iris is convex, considerable danger is run in completing the section of the cornea, of entangling and wounding it with the edge of the knife; and Mr. Ware considered Wenzel made a very important practical remark to avoid this difficulty, which was in rubbing the cornea gently downwards with the finger. The incision for cataract should not be too small, nor terminate opposite the pupil, otherwise a cicatrix would form here, which would obstruct the sight afterwards. Care should be taken, that the knife did not slip between the lamina of the cornea only, but went sufficiently deep to pass through it: neither should the instrument be carried so far as to run a risk, on the opposite side, of wounding the iris at its junction with the sclerotica. I think decidedly with Mr. Ware, that the cornea *never ought*, in any case, to be punctured in the first instance, and Wenzel allows this so far to be valid when the pupil is much contracted. The anterior part of the cornea should be rubbed gently, to detach any opaque part that might remain of the lens. When these bodies are prevented being easily separated, from adhesions or any other cause, they are to be broken down with the tenaculum. In operating, be very careful not to use any unnecessary pressure, so as to force the vitreous humour to escape; what requisite pressure is employed must be seasonably removed, when the knife has pierced the cornea opposite to where it entered. The lens should be punctured in the centre, not in the circumference. The whole of the cataract should, if possible, be removed. If the capsule be opaque, Mr. Ware advises, that a fine pointed instrument should be introduced carefully under the flap and through the pupil; the lens is then to be punctured in a circular direction, as near the rim of the pupil as the instrument can safely be applied without injuring the iris; when detached, it may be removed with a small delicate pair of forceps.

ON AN ARTIFICIAL PUPIL.

It may be necessary to attempt the formation of an artificial pupil, from the closure of it permanently after the operation, I have previously described in detail: and also from the following one, that of depression;—during the process of restoration, the pupil occasionally is found to become so contracted, that it is nearly completely shut, so as to obstruct vision altogether. Whatever cause may remotely, or immediately occasion this deformity, whether from excessive inflammation of the coats of the eye, or of the iris itself, an operation becomes indispensable, having previously attempted, constitutionally and locally, by the application of belladonna, ineffectually to produce an enlargement; and the first person who ventured to adopt a plan for its removal, was Cheselden, one of the surgeons formerly at St. Thomas's Hospital;—he did this with a couching needle, having a sharp cutting edge on the one side only;—he introduced it through the sclerotica, at a very little distance from the cornea, into the interior of the eye, and which he made to enter the iris at the outer angle; he then forced gradually the point of the instrument through the anterior chamber of the aqueous humour to the other extremity of the iris nearest the nose, he turned the edge of the needle backwards, and in withdrawing it, made a transverse section of the iris;—it appears, that the contractile powers of this membrane, made the opening, which was but small, considerably larger, and the operation was eminently successful. Professor Scarpa, in his valuable work, recommends a straight slender couching needle to be introduced through the sclerotica, at the outer or external edge, at the distance of two lines from the cornea, and then to be pushed to the upper and inner edge of the iris;—it is made to perforate the inner edge of this membrane at its upper part, and a portion of the edge of the membrane is to be detached by its means from the ciliary ligaments by repeated exertions, till a considerable aperture is made, and this detached membrane is then to be left in the aqueous humour to be finally absorbed: at the conclusion he seems to think it might be done more effectually with a curved needle. Other authors have written on this subject, from which it would appear, that whatever method tends most to facilitate and simplify the detaching a circular portion of the iris, would be the most preferable: I have detailed briefly these two, in order to shew the intention to be kept in view. Some surgeons are unfavourable to the formation of artificial pupils, but I think success in some few cases would fully warrant such attempts.

ON COUCHING.

By couching, is understood a *depression* of the crystalline lens, either to one side or to the bottom of the eye, removing it from its axis. The operation is not only very easy but simple. There are three kinds of needles that have been used for performing it, one of which is a very old one, and rarely used, if at all, at the present day, being larger than is necessary, and more productive of inflammation; its point is in the form of a spear.

The celebrated Mr. Sharpe made a great improvement on this, in having it a little curved at its ends; in other respects it is similar to the former. But Mr. Hey, a very clever and ingenious surgeon at Leeds, and author of very excellent practical observations, has introduced one of a much better form than either of the above, and which, on account of its shape and small size, is attended with but slight inflammation, and may be introduced repeatedly; it is about an inch in length, small, pointed at the end, very light, and has two shoulders to it, and in some degree spear-pointed;—but the spear is very short. The only instruments that may be generally seen in use, is this and Professor Scarpa's needle, which is curved a little at the point, but is much too long.

The Operation is to be thus performed.

Place the patient in a chair before a window, in order to have as strong a light as possible; in this, it differs from the operation of extraction: some, however, use the same precautions here as in extraction, but they appear to be unnecessary. The surgeon is to be seated in an elevated chair, or what is still better, to stand before the patient;—the sound eye is to be closed, and covered with a handkerchief by an assistant, who is also to support the patient's head on the back of the chair;—the patient is to be requested to turn his eye rather towards his nose, and the operator, with his one hand, is to fix it momentarily steady:—he is then to introduce the needle through the sclerotic coat, one line below the transverse diameter of the eye, and one-sixteenth part of an inch (some recommend a distance of two lines or more) behind the junction of the transparent cornea with the opaque, and it is to be passed as if directed to the centre of the eye, inclining it *downwards* in the first instance. Having reached the ciliary processes, which are carefully to be avoided, the handle is to be brought upwards and downwards, so that the point of the needle, which passes under the pupil, may be easily observable through it;—the needle is to be moved gently *upwards* and *backwards* upon the crystalline lens, if the operator's object be to depress it to the bottom of the eye, or on the side, if his intention be to cause its removal in that direction: the former is far preferable, as the lens will not be so likely to recover its situation again. The object to be kept in view, is to lacerate the inner surface of the lens, so that it may escape into the vitreous humour: many deem it essential to the success of the operation, that the anterior layer of the capsule should be also lacerated, as the absorption of the lens will be much facilitated.

There are several advantages attending this operation;—one is, the ease with which it is done; another is, that if the lens should happen to be in a fluid state, it will immediately escape on puncturing the capsule; therefore it is preferable to be performed in children, as the lens is seldom found solid in them; also if it should not succeed in the first instance, yet on account of the simplicity and ease with which it is done, it may be often repeated; whereas in the mode by extraction, if a cure be not accomplished in the first instance, the eye will be inevitably lost. Mr. Hey, as well as other professional gentlemen, are of opinion, that the operation by couching, is by far the best; however there are objections to it. In the *first* place, the cataract is liable to rise again into its former place, and patients do not like to submit to repeated operations, thinking that the surgeon does not know what he is about. Secondly, it gives no relief in a capsular cataract:—it may be lacerated in the operation, and the rays of light may pass for a short time perhaps, but it will be soon obstructed by the broken pieces of the capsule, rising again, and without they are absorbed, which is not very commonly the case, the disease will return again to its full extent. And lastly, it is unsuccessful when the capsule adheres to the iris.

I would advise those gentlemen who wish to get credit for skill as oculists, to commence practice with the extraction of the cataract; but those, on the contrary, who are likely to have but few operations, perhaps that of couching may answer their ends better, as it is so simple, and easy, requiring only a moderate share of attention for its performance.

On breaking down the Cataract; or, as termed by Dr. Farre, *an Operation on the Capsule.*

This operation is also very simple, and one which does not expose the patient to a repetition, as that of couching does. It is to the late Mr. Saunders the profession is indebted for this mode, which he adopted and practised with very great success. I can only assert, if it be generally attended with the happy results I have witnessed, I should certainly give it the preference to couching. It appears from Mr. Saunders's success, that out of sixty persons, fifty-two recovered their sight.

The operation consists either in introducing the needle *anterior* to, and in *front* of the iris; or posterior, that is, *behind* that membrane;—the pupil is to be dilated with a solution of the extract of belladonna, which will effect its enlargement in from half an hour to an hour;—the patient being placed in a convenient posture, and the precautions before expressed being attended to. When he performed this operation on young children, he was obliged to be aided by several assistants to keep the child steady, and he made use of an elevator, invented by Pelleir, which he inserted under the upper eye-lid, while one of the assistants depressed the lower;—by the moderate pressure instantly applied with the elevator, the eye was stationary. The needle here used was very slender, with a cutting edge from the shoulders to its point: I think Mr. Hey's needle will do equally well, or Professor Scarpa's, if shortened in length. It is to be introduced either through the cornea near its junction with the sclerotica in the *anterior* operation, or through the sclerotica a little behind the iris in the *posterior;* the point of the needle is to be directed to the centre of the dilated pupil, so as to puncture the middle of the capsule of the crystalline lens, and to lacerate a central portion of it equal to the size of the pupil in a natural state: if the lens were *opaque*, he used to rupture its texture with the needle: but if a *fluid* cataract, wounding the capsule was all he aimed at;—if capsular, he did so with more freedom: thus the lens will escape into the anterior chamber of the aqueous humour: the parts of the lens will be afterwards observed floating in this humour; if fluid, it will render it turbid; but in a short time, these appearances will be entirely removed by absorption. One operation will frequently accomplish a cure. Mr. Saunders has been obliged to perform it five successive times in some few cases, but it should never be repeated under an interval of a fortnight at least: the inflammation is to be kept under by local, and even general bleeding, if required. Mr. Saunders seldom performed the posterior operation: his practice is far preferable either to Mr. Ware or to Mr. Gibson. This operation may be performed both on infants and adults with success, but the ages in which he met with most success, were from eighteen months to four years, in those who were the subject of congenital cataract.

The advocates for couching in preference to extraction, are numerous: I have detailed what appear to be the most favourable modes of operating. To enter into a discussion of the advantages of one operation in preference to another, would only be involving myself in an endless controversy. I have the very best authorities for recommending extraction; but I beg leave to observe, let others do as I have done, think for themselves, and not be biassed by any illiberal prejudices;—writers of very great eminence support depression.

ON THE USE OF BELLADONNA.

Deadly night-shade, as made into an extract according to the Pharmacopœia of the London College, is a violent narcotic poison: it is only on account of the peculiar or specific virtue of this plant, that I introduce it in this place, as notice will be hereafter taken of it among vegetable poisons. One grain, dissolved in water, and applied either into the eye between the eyelids, or on the eyebrows, causes a remarkable dilatation of the pupil, and the late Mr. Saunders made use of it with this intention: it discovers whether there are any adhesions of the iris with the capsule of the lens. After the operation for congenital cataract, Mr. Saunders applied it externally, so as to keep the pupil dilated till the inflammatory process had subsided; by which plan he prevented the edge of the iris from forming adhesions with the margin of the lacerated capsule: it may be also very advantageously employed should adhesions form after the operation of extraction in the early part of the process, so as to cause dilatation to its natural circumference.

ON FISTULA LACHRYMALIS.

This is a disease in which the natural course of the tears is obstructed, in consequence of a stricture, or closure in the membrane lining the ductus ad nasum: in whatever state it is found, whether there is a sinus or not, yet it takes this name. There are *three* states of the disease: the *first* is a simple enlargement of the lachrymal sac, denoted by a tumour on the internal canthus, which if large and distended, extends one-third above the tendon of the orbicularis muscle; the skin over the tumour is undiscoloured, and scarcely any pain felt; when the patient is exposed to the cold or wind, the tears flow down over the cheeks. If the further progress of the disease be not arrested, then the *second* state is formed, inflammation takes place, the tumour becomes red and painful, and the eyelids much swollen: on pressing the tumour, instead of a jelly-like matter, a mucus first presents, then pus is discharged mixed with tears. The *third* state is the true fistula lachrymalis: when the inner part of the sac becomes inflamed, suppuration takes place from the irritation of the tears, and an abscess forms, not directly opposite the sac itself, but below it;—at length the ulcerative process forms a fistulous orifice a little below the inner corner of the eye, about half an inch from the lachrymal sac; a fungous projection of the orifice now takes place, for which caustics have often been used with but little success, and only attended with temporary relief, and not to be removed effectually without an operation. When the ulcerative orifice, or opening, is thus established in the inner canthus of the eye, the tears will pass that way, and prevent its healing; occasionally the os unguis gets carious from this affection, and the other eye becomes weak and inflamed; hence the tears pass as usual through the puncta lachrymalia into the lachrymal sac, they are prevented, from the *obstruction*, taking their usual course into the nose, the sac becomes distended, inflamed, suppurates and ulcerates, so that no prospect of cure can be expected till the obstruction into the nose, the primary cause, is removed by an operation.

The original cause of the affection is various; by some it is thought to proceed from a common cataract, by others from catarrhal affections in scrophulous habits, occurring more generally in children than in adults: next to these the venereal disease may be reckoned, and in this latter case the fistula lachrymalis cannot be expected to be used before the specific poison, glueing the parts together, is got rid of, and it has been known, though rarely, that the use of mercury in these cases has effectually cured both diseases. A pustule of the small-pox has been observed to have occasioned an obstruction in the duct, and not unfrequently this is the case. Professor Scarpa thinks that it originates from a yellow viscid matter, secreted by the lining of the eyelids, and from the meibomian glands, which accumulates in the sac.

The treatment of the *first* state of the complaint consists in passing the tube of a fine silver syringe into one of the puncta lachrymalia, so as to press against the other and close it, then let a single injection be thrown in, the more simple the better, as warm water; but if inflammation be present, a weak solution of acetate of lead will be proper; if the obstruction be not very considerable, or the ductus ad nasum only partially closed, so that the tears are able still, though not to the usual extent, to pass into the nose, this plan will be sufficient, as a free passage will thus be restored. The introduction of quicksilver will be found highly beneficial, proposed by Sir W. Blizard to be done through a tube. It is to be observed, some little force may be used prudently to restore the passage. I have merely considered the obstruction in the simplest manner: should it be deemed to arise, according to Scarpa, from an altered secretion of the eyelids and meibomian glands, it will be right to employ applications to correct this morbid disposition, and a collyrium, composed of the sulphate of zinc, dissolved in rose water, above ℈ss. of the former to ℔ss. of the latter, will be requisite: if an ointment should be preferred, the ung. hydr. nitr. united with lard, or Janin's ophthalmic ointment, about one part of it to three of lead, applied with a camel-hair pencil on the edge of the eyelids. In the *second* stage, where inflammation has extended to the formation of an abscess, which has not burst, it will require an operation, which consists in opening the sac, and giving vent to the contents; then pass a probe into the ductus ad nasum to force the stricture, and then put in a pin, or style, to keep it open. Mr. Ware was the first person who performed the operation, which is as follows: having felt for the ridge of the orbit, about one-eighth of an inch behind it, on the lower edge of the eye, is situated the lachrymal sac; then carry a probe-pointed bistoury, or a phymosis knife, with the point, immediately into the sac; then the probe is to be used with a little degree of bearing and force, so as to overcome the stricture; and to ascertain whether it has passed into the nose or not, pass a director under the inferior turbinated bone, you touch the probe, then withdraw the probe, and introduce a style, with a flattened head to it, into the passage, the head of it is to rest upon the inner canthus of the eye; to be certain, however, then, that the passage is clear, it will be right to direct the patient to blow his nose, and if it be so, a bloody matter will be found on the handkerchief. If there come on much inflammation, direct the patient to keep on a poultice for a few days. As to how long the style ought to remain in the ductus ad nasum, must depend upon this circumstance—as long as any matter, or purulent discharge is kept up, or even capable of being squeezed out on pressure, so long it ought to remain, and sometimes it is necessary to let it stay for the space of three months longer. The end of the style gets flattened, and produces but little inconvenience or deformity; it should be withdrawn frequently, and warm water injected through the passage. Mr. Ware has thought, generally speaking, *six weeks* to be long enough to allow the style to remain, but the practitioner *must be guided* entirely by circumstances in this respect.

If from the long existence of the disease the nasal duct be perfectly obstructed, either from ossification or any other cause, then it becomes necessary to have recourse to the following operation: a larger opening must be made in the sac, then pass the point of a knife through the os unguis *obliquely outwards*, and turn it a little around, so as to break through the bone and form a circular orifice; then withdraw the knife and pass a probe into the nose, introduce a style as previously advised, and let it remain till the orifice, thus artificially formed through the os unguis, is completely established and fistulous.

LECTURE XVII.

ON THE OPERATION FOR THE REMOVAL OF THE EYE.

An operation for removing the important organ of vision becomes necessary in cancerous affections, and also in that particular disease, the fungus hæmatodes. A *true cancer* of the eye is a very rare occurrence, and the instances on record are very few. I recollect to have heard of but one well defined case, and in this subject it did not disease the eye itself, but had its origin in the lachrymal gland, and destroyed life by the great irritation produced in the system by the affection of the brain. We read of the eyeball becoming gradually enlarged, and presenting that irregular scirrhous state this disease assumes in other parts of the body, the structure of the eye becomes completely disorganized and changed, and vision becomes lost: this malignant and lamentable disease at length ulcerates, and proves fatal by its extension along the optic nerve to the brain, or the constant irritation it occasions previous to its affecting that part: it is accompanied with those burning lancinating pains peculiar to this complaint. Authors have defined three states of cancer, two of which may be fairly classed among other affections, brought to assume the appearance of this disease by improper applications.

Fungus hæmatodes begins with the appearance of mucus at the bottom of the eye, presenting a bluish purple aspect from the reflection of the rays of light through it; that which was before of a light colour is now mixed with bloody spots, the eye soon becomes swollen, and the tunica conjunctiva appears tinged with blood of a purple venous colour: at length the tumour protrudes through the opaque cornea, and when much enlarged, a good deal of it commonly sloughs, and the ultimate consequences are, that a luxuriant fungus arises; this extends through the foramina, resting on the brain. The patient immediately becomes blind, and is seized with a considerable degree of coma, and the scene is soon closed with all the symptoms of compressed brain. A woman labouring under this fatal disease, was lately seen. The origin of the affection is evidently in the tendinous structure, seldom affecting the glands. Mr. Wardrop, who has written on this subject, says, that it originates in the nervous structure; but I affirm, that the disease first makes its appearance in the sclerotic coat, and that the retina, as well as the optic nerve and choroid coat, are only subsequently affected by the communication from the sclerotica, or tendinous coat of the eye. It is observed, that this disease is very frequent in the tendinous expansion of the fore arm, an example of which, I have within the last day or two seen; and also in the fascia lata of the thigh, and that the disease is communicated from thence to other parts. If the eye be to be removed at all, it should be done in the earliest stages of the disease, and I am sorry to state, that the operation for it, is one of the most unsuccessful in surgery.

Operation.

Push a curved needle through the eye, for the purpose of fixing it, then with a double edged knife divide the inner canthus, and pass it down around the eye till it is separated from the orbit: having proceeded as far as the optic nerve, divide it with a small straight knife, and also those muscles that may be necessary—some use a curved knife. The hæmorrhage is commonly slight, and ceases in the course of five minutes. The parts are then to be brought as near together as possible, and poultices must be applied if the pain be considerable.

ON POLYPI IN THE NOSE.

There are three different kinds of polypus; the *first* looks like jelly in the nose; it is coagulable lymph contained in a bladder, in general of a pyriform shape, hanging by a thin pedicle or neck, very moveable, and so little vascular as only here and there to be streaked with blood. The only inconvenience that it is attended with, is the prevention of a due degree of respiration during sleep; but when there is a polypus in both nostrils, the inconvenience is far greater, and much increased in wet weather.

REMOVAL.—The usual manner of removing it was by means of a forceps, but this was very unsuccessful, as the whole of it could very seldom be removed; the plan now adopted, in my opinion, is far preferable; it is thus: pass a pair of probe pointed scissars up the nose till you have reached the root of the polypus, then opening them, divide it at that part, and direct the patient to blow his nose, upon which it immediately escapes: but sometimes the polypus is so very large that it is impossible to effect its removal in the above manner, and in this case proceed with the scissars in the same manner to divide it at its neck; then pass one finger into the mouth to the back part of the nostril, and hook it down from above the velum pendulum palati.

The *second* species of polypus is of the hydatid kind; it can be distinguished from the last by the discharge of a thin watery fluid produced on pressure, and its again forming. It has been thought, that a weak solution of arsenic, or sublimate of mercury, applied to it, would be beneficial, and effect a cure.

The *third* kind of polypus is the most alarming of all; it is the malignant or cancerous; it hangs from the pituitary membrane—its base is very broad: it presents that hard scirrhous appearance in its early stages, similar to carcinoma in other parts. The disease is perfectly incurable, and all remedies that are employed should be only of the palliative kind, and merely to afford temporary relief and comfort, as very little can be done in these cases.

General remarks.—It is from mucous membranes polypi are found to grow generally: the nose, uterus, vagina, rectum, and the meatus auditorius externus, are where they are most frequently met with: the fleshy polypus of authors may be classed under the first description. Some mistake the hydatid polypus, and consider it a prolapsus of the Schneiderian membrane; others term it the vesicular polypus; but these may be considered as so many varieties when they exist: no description can be laid down of a disease but what there will be found some variety in practice. Mr. John Bell thinks that there are never originally any malignant polypi existing in the nose; he attributes their assuming this character to the irritation from the distention of the swelling in its confinement in so close a passage; and if this be the case, which I think very probable, I see no reason why in the early stages they might not be removed with perfect safety.

ON DROPSY OF THE ABDOMEN.

This disease is of two kinds, the ovarial and the peritoneal; the former called the encysted, the latter ascites. The peritoneum is a membrane lining the whole cavity of the abdomen, and naturally exhales a fluid for moistening the viscera, and preventing friction, &c. Various causes may produce a morbid increase of this secretion, such as the enlargement of the liver, spleen, &c.; any circumstance producing a torpid circulation; also a scrophulous affection of the mesenteric glands; too liberal a use of spirituous liquors, as well as anxiety of mind, may be also ranked among its other causes.

The encysted dropsy often occurs in people of a good constitution, and in this respect differs from ascites, which is commonly the effect of a worn out constitution; also in the ovarial dropsy it may commence very early in life, and yet the patient may live to a good old age; but the contrary is perceived to take place in ascites.

Dropsy of the ovary is of two kinds; in the first, the fluctuation sometimes is not very distinct. Before an operation is undertaken, the fluctuation should be distinctly ascertained, and unless *complicated* with ascites, the second kind, the swelling is either on one side the abdomen or the other; the water is at first collected in a number of cysts or bags, which do not adhere in the first instance, although adhesions between them take place subsequently. There would be great risk in operating in the early stages of this disease, and no benefit could possibly accrue, as if one of the cysts was opened, still others would remain; and the chances are, that peritoneal inflammation would take place, and the operation is only warranted when the quantity of fluid is pretty large. The quantity of water in ovarial dropsy is commonly from thirty to thirty-five pints, and cases have occurred where it exceeded ninety-seven; it varies also very much both in its consistence and colour, sometimes being yellow, at others ropy, and occasionally purulent: if thick at first, tapping will make it thinner, and vice versa. What is above stated is applicable to ascites or peritoneal dropsy, the distinguishing marks of which I shall now state: a swelling in the abdominal cavity, with a sense of tightness all over the belly, so that the patient's clothes gradually get too tight, and require enlarging; the breathing difficult and laborious, especially when in a recumbent posture, or in bed; a fluctuation may be distinctly felt by one hand being placed on one side the patient's abdomen, when it is struck forcibly on the opposite side with the other; besides there are many other concurrent symptoms, such as thirst, heat of the skin, scarcity of urine, &c.

PARACENTESIS ABDOMINIS.

The same method of operating is required in the ovarial dropsy as in ascites; I shall therefore merely describe the mode as performed in the latter. The trocar is the instrument generally in use; but when the integuments are thin, I should give preference to the *lancet*. Having placed the patient in an horizontal posture, with the head a little elevated, a flannel roller is to be applied on the upper part of the abdomen, and gradually drawn tighter as the water is drawn off, in order to support the patient by moderate pressure during the evacuation, as such a quantity of fluid being so suddenly drawn off, would occasion fainting, &c.; then pass a trocar or lancet in the linea alba, from one inch to two or three below the navel, as on one side of that line there will be some danger of wounding the epigastric artery: if it be the trocar that is used, and a sudden stop of the discharge happens when withdrawn, pass a blunt probe through the canula, in order to discharge any thing that may obstruct the free passage of the fluid through the tube. I think myself that the lancet is the most preferable instrument, and I have known instances where it has been used that the patients would by no means submit to the introduction of the trocar in a future operation; besides there is some risk attending the latter, for the end of the canula has been known, when the patient coughed, to lacerate the mesentery, by first rubbing against the peritoneum, and the result proved fatal, high inflammation having come on. A gentleman at Chichester proposed, some years ago, to cure dropsy by leaving an ivory canula in the abdomen for some time, and he related some cases where it succeeded: I shall offer no remark on the subject. The quantity of fluid contained in this disease, is very great, and during my apprenticeship Mrs. Davies had evacuated at seven different operations, with a short interval between each, a large pailful each time: she died soon after the last, from debility. This case convinced me to what an extent it will accumulate, as well as the time it took, after each operation, to re-produce the effects of the disease to its former extent, and as far as I recollect, the intervals gradually lessened. When the operation is finished, apply merely a piece of dry lint on the wound made, and support it by adhesive plaster, and bind round the abdomen a flannel bandage.

ON THE HARE-LIP.

Hare-lip takes its name from its resemblance to the fissure in a hare's lip: it most commonly occurs in children, being born with this malformation in one or both lips. The fissure mostly happens in the upper lip, and often extends back to the roof of the mouth, and to the soft palate: it is sometimes double, (i. e.) taking place on each side the lip, a portion of the latter remaining between the fissures; occasionally the space intervening is considerable, but mostly they are not far apart; whenever it occurs it occasions very great deformity, and can only be remediable by an operation.

The time proper, and most likely for the operation to be attended with success, is *after the age of two years;* prior to this it is conceived, that there is a great risk of the child's losing its life: in fact many instances have been witnessed when children have been carried off by convulsions at an earlier age, which ought to put the surgeon on his guard. The operation, it must be admitted, has certainly been performed in children very young, and with complete success; but as it has proved fatal in several cases, I conceive it will be sufficient to defer attempting it at an earlier period than I have above stated, as it is nearly certain of being attended with a cure of the malformation when children have attained two years of age, their system at that period being more capable of resisting any constitutional irritation that may be excited.

Mode of operating.

The chief object the surgeon has in view, is to form an acute angle, in removing the edges of the fissure by two smooth and even incisions meeting at a point at the upper part, so as to produce an entire new surface on each side, in such a manner, that when closed together the whole can be approximated neatly without an intervening space; and with this view pass a double edged cataract knife through the upper part of the lip, continuing the incision down to the bottom, parallel to the fissure on one side; then the knife must be carried in the same manner on the other side: make two interrupted sutures; the first midway between the nose and under edge of the lip, passing the needle before and behind, and taking care that it gets completely through the edges of the lip into the mouth; the second suture is to be made through the middle of the red part of the lip, quite through to the opposite side, otherwise there will be a small fissure still remaining; then tie both ligatures, and the edges will be nicely and exactly brought into contact, so as to be united by adhesion.

Two silver pins, with steel points, were formerly used, passed nearly through the edges of the wound, and a thread carried around them in the form of a figure of eight; but from their producing generally a considerable degree of irritation, they are now very commonly laid by. If during the operation any considerable hæmorrhage (for there will always be some) arise, it will be right to carry the needle and ligature near the bleeding vessel; this will be much better than applying a ligature around the vessel, for if it be done, the union will be incomplete: the bleeding almost invariably ceases when the edges of the wound are accurately brought into contact. If the hare-lip be double, (i. e.) if there are two fissures present, the operation is to be performed in the above manner, only in this respect, that it is only to be done on one side at first, and not to proceed to any further operation till that fissure is quite healed, when the same operation may be performed on the one remaining. A portion of the jaw occasionally projects between the fissures, and sometimes a tooth; when this latter happens, and it presses on the jaw, it may be removed; even the removal of a piece of the jaw is now and then necessary.

The period at which the ligatures are to be taken away, will be from the fourth to the fifth day in adults, and in children, from the fifth to the sixth: but this must depend upon circumstances, for if it be perceived the process of ulceration is commencing, it will be right to take them away on the fifth day, and if at that time the lip have yielded at all, it will be right to apply a narrow and long slip of adhesive plaster across it to the cheeks, so as to allow a relaxation during the crying of the child.

If the child be tedious and fretful, the administration of a small quantity of the syr. papav. alb. will answer the purpose of quieting it.

I never saw the hare-lip or fissure in the under lip, but a *cancerous affection* to which it is liable requires the same operation as that kind which I have described for an hare-lip: according to the extent of the division, the length of the incision towards the chin is to be made; the knife is to be carried from the upper part of the lip in an oblique direction towards the chin on one side the diseased part, and the same incision is to be made on the opposite side, so as to cut out a complete angular piece, and the parts are to be brought together by three sutures: without the divisions are accurately made so as to form a complete angle, the parts cannot be brought closely together.

When an hare-lip is complicated with a fissure in the roof of the mouth, a piece of sponge, joined by means of silk to a silver plate, will be found beneficial; the plate of silver must be made exactly adapted to the arch of the palate: the sponge is to be introduced into the fissure, and the plate attached to it is to remain in the roof of the mouth: the sponge being dry when inserted, absorbs moisture from the surrounding parts, and becomes so enlarged as to retain its position and the silver plate attached to it. But when the fissure extends to the soft palate, and is confined solely to the uvula and velum pendulum palati, there is no instrument can be used so as to remedy this defect, although a silver plate extending along the bony parts, has been attempted in various shapes.

LECTURE XVIII.

ON PUNCTURING THE BLADDER.

THERE are three ways proposed to puncture the bladder in cases of retention of urine—first, *per rectum*. When the bladder is excessively distended, by an examination per anum, it will be found protruding downwards and occupying the proper situation of the rectum at its extremity, and is immediately felt on the introduction of the finger. The tumour is very tender, and a fluctuation always perceptible, so that there can seldom be a doubt with respect to the nature of the case. As soon as the bladder is found projecting on the rectum, a surgeon, void of anatomical knowledge, would not hesitate to puncture it. The peritoneum is reflected in that manner as to give ample space for allowing the bladder to be opened, so as to be in no danger of wounding the above membrane. The vasæ deferentiæ leave an opening of a triangular form behind the prostate, in the *centre* of which the trocar is to be introduced.

The operation is a very simple one, and may be thus performed: having a trocar of considerable length, about four inches, and a canula three, and somewhat curved (although a straight one will answer the purpose) it is to be carried up to the superior part of the bladder, having previously passed the fore finger of the left hand into the anus to serve as a director, then lowering the handle, and elevating the point through the axis of the pelvis, as if it were intended to come out at the abdominal muscles, it enters the bladder; the trocar is then to be withdrawn, and the urine evacuated through the canula. This necessary operation would always be had recourse to, if it were not for the inconveniences resulting from it: a very material one is, that the urine distilling through the canula, (or when this is withdrawn, which must be done), it passes in contact with the rectum, and produces a considerable degree of irritation and thickening of its internal coat; besides there is a constant inclination of voiding the fæces, together with an extreme tenderness of the gut. With respect to the danger of wounding the vesiculæ seminales, or the vasæ deferentiæ, this will be avoided by passing the instrument at least an inch and an half up the rectum, as they would most certainly be injured if it were not carried sufficiently high up.

2. *Above the pubis:*—When therefore a surgeon is called in to a patient labouring under retention of urine, and having a considerable degree of swelling and fluctuation perceptible above the os pubis, he would not hesitate about puncturing the bladder if every other means previously resorted to had quite failed: the manner of this operation I shall now detail.—When the bladder is empty and in a relaxed state, then the peritoneum is reflected in such a manner as to be in contact with the rectus muscle, and consequently in the direction of the pubis; but when distended, the reflection is at some distance from the latter, and not liable to be wounded by the trocar: first feel for the symphisis pubis, then make an incision with a lance or scalpel through the integuments, about an inch in length, in the direction of the linea alba, immediately above the symphisis, then with a straight trocar and canula, (both rather short) although many prefer a curved one, pass it

so as to correspond with the axis of the bladder into this viscus, that is, obliquely downwards and backwards; be careful of the direction; as the trocar might otherwise pass between the bladder and pubis. This simple operation has been objected to by experienced practitioners for two reasons; first, because an ulceration of the bladder takes place in consequence of the canula being left in: and the second is, that the urine is liable to be extravasated into the cellular membrane, between the abdominal muscles and bladder: both of these objections may be easily refuted. To counteract the first, an elastic gum catheter might be introduced, which will answer as well as the canula, and from the use of which no inconvenience will arise. The second objection is conceived to be fallacious, and I have heard a medical gentleman of some celebrity relate three cases where no extravasation happened. The elastic gum catheter may be worn for some time without causing any ill effects. Mr. Sharp, Mr. Abernethy, and Mr. Astley Cooper are favourable to this operation: Sir Everard Home and Mr. Hey of Leeds, as well as others, think the operation per rectum preferable. I should be disposed, in case of diseased prostate, where the catheter could not be passed, though such instances are very rare, as in the practice of one of our most popular surgeons, a case never occurred of a disease of that gland where it could not be introduced, to tap above the pubis.

In cases of diseased prostate, the operation *per perineum*, would be highly dangerous; it is similar in many respects to that of lithotomy. The patient is to be bound in the same manner, an incision, an inch and an half in length, is to be made in perineo, so as to lay bare the bulb of the penis; having done this, introduce one finger, and it will be found resting on the prostate gland, which is to be pushed a little to the right side of the patient, and the trocar is to be carried by it in a direct line backwards into the side of the bladder nearly at the base of the prostate. This operation will be much facilitated by introducing at the time one finger into the rectum. It requires a perfect anatomical knowledge for the proper execution of it. The trocar and canula must be of a convenient length.

Having now stated the usual methods practised in puncturing the bladder, I shall briefly enumerate the causes that would dictate the necessity of either operation.

ON ISCHURIA, OR RETENTION OF URINE.

The distinction between suppression and retention of urine is this: the former means a defect in the secretion of the kidneys; the latter, when secreted, an inability of expelling it.

Those advanced in life are most frequently the subjects of this affection. The bladder holds about one pint and a half of urine without inconvenience; but when that quantity becomes considerably augmented, an urgent desire is felt of evacuating it: and if this cannot be attained the bladder in time loses its contractile power, and becomes paralytic; still, for a time, as the bladder becomes more and more dilated, efforts are made to obtain relief by its discharge, till the distention can proceed no further: and it would evidently become lacerated did it not derive support from the uniform pressure of the contiguous parts. When the retention has continued for three or four days, the neck of the bladder expands and urine escapes, but this should not mislead the surgeon; it may continue to dribble away till the eighth or tenth day, or till the bladder sloughs; not only the patient but his friends are led to believe, the imminent danger has ceased, from the time the urine escapes; but this is most deceptive, and here let me caution the young surgeon not to be so blind and credulous. The continued distention causes an universal inflammation of the abdomen, and the symptoms of incipient mortification are here mistaken for relief. The pressure of the abdominal parietes prevents a laceration, and the opening found on dissection is caused by mortification. Occasionally, even from the commencement, the urine is not altogether retained, but it escapes in trifling quantities without manifest relief, and in these cases the disease is liable to be mistaken for a strangury.

The hard, circumscribed, and rather prominent tumour in the hypogastrium, immediately above the symphisis pubis, combined with other circumstances, will always detect the disease.

The causes of this affection are numerous;—paralysis of the bladder, resulting from neglecting the calls of nature after drinking to excess: concussion of the medulla spinalis: inflammation of the neck of the bladder: extraneous bodies in the bladder. In pregnant women, from pressure by the gravid uterus: enlargement of the prostate gland; and strictures in the urethra.

Treatment.

When called in to a patient labouring under a retention of urine, prior to the performance of an operation, it will be right to have recourse to other means, and the first and most obvious will be the introduction of the catheter; but if this should not be practicable at first, I should bleed, and emerge the patient in the tepid bath, and administer opium, &c. If, however, after the lapse of several hours, these remedies should not succeed, and no probability remaining of passing the catheter, the operation above the pubis would be advisable: but if a stricture existed, I should proceed to operate thus, which would be a material deviation from either of the three previously detailed, as it would consist in making an opening into the urethra: in fact, excepting the case of diseased prostate, already alluded to, I should never think of puncturing the bladder in cases of stricture; my only object would be, to cut beyond the stricture, so as entirely to free the latter. As soon, therefore, as I should perceive the urethra to be considerably swollen and enlarged, I should direct the patient to make a violent effort to void his urine; at this very juncture, place your finger upon the perineum, and the tumour and fluctuation will be very evident, and here the incision is to commence: another similar exertion, as just stated, is to be then made, and the tumour being again distinctly felt, there will be no difficulty in proceeding with the further necessary incision, going on, as it were, mechanically. Another method, and one very easy, is to pass a staff into the urethra, as far as the stricture (for it will go no further), then cut down and lay it bare, then divide the stricture in the direction of the groove of the staff, carrying the knife towards the arch of the pubis. By these methods it is possible to relieve the stricture, which cannot otherwise happen: those arising from accidents, as in falling, are more easily cured than when caused by gonorrhœa, &c. It is attended with this advantage, that if it should not succeed, yet recourse may be immediately had to the trocar and canula.

LECTURE XIX.

ON THE STRUCTURE OF CALCULI.

The different kinds of structure that the various calculi assume, ought to be well known, as well as their external appearances: this will depend, a great deal, on the mode of living, and the nature of the nucleus, &c. Calculi are commonly laminated, connected together by means of a few calculous fibres, not quite so much laminated as the others. In the centre is the nucleus, which is variously formed, sometimes from mucus, at other times from a coagula of blood, or from extraneous substances getting into the bladder, as needles, for example, and even pieces of a bougie broken off. Calculi are also different in their colour from each other, not only in the whole, but also varying in their parts. Their composition is also differing. The size generally extracted is from two to three ounces. The largest that I have heard of extracted weighed four ounces and a half; but there is no judging of their weight from their size, as a stone of four ounces may not be as large in bulk as one of an ounce and a half, as it depends upon the nature of the component parts. There is one, which is preserved in Trinity College, Cambridge, and was taken as far back as the reign of Charles the Second; its weight is thirty-three ounces, three drachms, and thirty-six grains: but the largest that has ever been known, in the human subject, was in a case reported in the Philosophical Transactions for 1809, by Sir James Earle. The subject was Sir J. Ogleby, who had long been labouring under symptoms of stone in the bladder: an operation was performed on him, at his particular request, by Mr. Cline; but, on account of the size of the calculus, it was found impossible to extract it whole, and an attempt was made to break it; this was not attended with the desired success, as only a few fragments were taken away: he did not long survive the operation, and after death his body was examined; a stone of an immense size was found in the bladder; it weighed forty-four ounces, apothecaries' weight: its form was elliptical; its long axis of circumference sixteen inches, its short diameter four and a half, its long diameter five and a half, and its short axis of circumference fourteen inches. It entirely filled the bladder, and even distended it; it completely occupied the cavity of the pelvis, projecting beyond and resting on the pubes. The pelvis of the kidneys was much enlarged, as well as the ureters, which appeared to be the receptacle of the urine. On analyzing the stone, it consisted of phosphate of ammonia and magnesia, with phosphate of lime, united with an unusually large portion of animal matter. He had, in addition to the usual symptoms of stone, a paralytic affection of the lower extremities. The greatest number of calculi seen, extracted at one time, was twenty-two. Dr. Catling has seen twenty-five: they were about the size of a waistcoat button. Mr. Cooper has extracted thirty-seven at one time, of the size of marbles: in another person nine of some size.

ON THE CHEMICAL COMPOSITION OF CALCULI.

Urinary calculi are divided into four species:—1st. Those calculi are most common which are formed from the uric acid, the colour similar to wood, and the appearance when cut into resembles the trunk of the branch of a tree; these are called the *uric acid concretion*, and are soluble in alkalies and acids. Lithic, or uric acid, is a composition of carbon, nitrogen, hydrogen, and oxygen: it is that sediment in the urine which appears in the form of small red crystals very frequently observed to be deposited. The 2d are those formed from phosphate of ammonia and magnesia, having a whitish grey appearance, and often transparent crystals on their surfaces, and soluble in muriatic acid; these are termed the *fusible calculi*. *Note.*—I would observe respecting this stone, that there have been obvious proofs when it has existed in the bladder, of the latter being in a diseased state, and that its formation is more from diseased mucus than from the urine. When, therefore, small portions of this calculus pass by urine, which may be easily known by analyzing them, the patient may be assured with confidence of the utility of the operation: there is commonly a quantity of coagulable lymph coming off at the same time with the portions of stone.—The 3d kind is the *mulberry calculus*, consisting of oxalate and phosphate of lime; so named from its resemblance to the mulberry stone.—The 4th and last are termed the *bone-earth calculi*, composed of the phosphate of lime.

A gentleman, whose name I do not at this moment recollect, has published an account in the Philosophical Transactions, from which it appears he has analyzed 150 calculi; and has given their component parts, shewing at the same time the forms in which they mostly occur, viz.: 16 of uric acid: 45 of uric acid and a small quantity of phosphate: 66 of large quantities of ammonia and magnesia, and a small quantity of uric acid: 12 of phosphate of lime: 5 of uric acid with phosphate and a nuclus of phosphate of lime: and 6 of the mulberry calculi, or oxalate of lime.

In the third volume of the Med. Chirurg. Transactions will be found the following minute analysis of urine by Benzelin:—Water 933.00; urea 30.10; sulphate of potass 3.71; sulphate of soda 3.16; phosphate of soda 2.94; muriate of soda 4.45; phosphate of ammonia 1.65; muriate of ammonia 1.50; free lactic acid; lactate of ammonia; animal matter soluble in alcohol, and usually accompanying the lactates; animal matter insoluble in alcohol; urea not separable from the preceding 17.14; earthy phosphates with a trace of fluate of lime 1.00; uric acid 1.00; mucus of the bladder 0.32; silex 0.03= 1000.00.

MEDICAL TREATMENT.

Some calculi are acted upon by alkalies, others by acids. From the experiments of Fourcroy and Vauquelin, a weak solution of potass, or soda, gradually dissolves calculi composed of uric acid and the urate of ammonia. Weakly diluted muriatic, or nitric acid, readily dissolves those formed of the phosphate of lime and the ammoniaco-magnesian phosphate. Diluted nitric acid will nearly dissolve those composed of the oxalate of lime. Fourcroy tells us that the caustic alkali alone is capable of dissolving almost every ingredient in the composition of calculi, and hence, no remedy in calculous affections is more universally employed than lime-water as a solvent. I believe a Mrs. Steevens had no less a sum than £5000 from parliament for a nostrum, of which this was the principal ingredient, united so as to form a soap.

From the above experiments it is evident that the different varieties of calculi can be dissolved out of the body, or they might even in the bladder be soluble, if that organ would receive these medicines passively, and not inflame and suppurate, on their introduction; even in that case, there would be a trifling difficulty to surmount, which is, that the precise nature of the calculus could not be readily ascertained. From these circumstances it has been attempted by various authors, who have written expressly for the purpose, to prove that they are of no kind of utility in cases of stone; in this they argue chemically (knowing the changes they must necessarily undergo before they arrive at the bladder), but not philosophically. I will allow, that as far as the idea has prevailed of their power of dissolving calculi, it is at least ingenious; but independent of this they are of material benefit in practice; first, in mitigating pain; and secondly, as excellent preparations for the operation of lithotomy.

The good effects of one of the preparations of soda could not have been more manifest than in a naval commander, who before he had recourse to this medicine was in constant pain and anguish, and although he had continued its use but a little while, he got perfectly easy and remained so, although the stone was easily felt in the bladder. The dose he took was two drachms in twenty-four hours of the subcarbonate of soda, dissolved in a quart of water; and I think the way it must have acted was by acting on the nervous powers, and consequently diminishing the irritability of the constitution, which, of course, would afford material relief.—Query. Has this medicine any specific effect on the nerves, as it is found to be eminently serviceable in tic doloreux and other affections, in affording ease?

In some of Mrs. Steevens's cases it would appear from Dr. W. Hunter, and others, that the calculi were not actually dissolved, but rather incased in a cyst, as they are often found, and were not capable of irritating the bladder as formerly; and they might be compared in these instances to a ball, or any other extraneous body, which is known to remain for years in the body perfectly inactive when lymph becomes effused so as to form a complete covering. Aërated soda water may be given—the aërated kali.—The liquor. potassæ is attended with similar good effects, especially when the bladder is irritable; it is better to combine it with opium. Acids, such as the sulphuric or muriatic, may be also found beneficial. In some cases they have but little effect, as has been satisfactorily proved, where they have not only been administered by the mouth, but also in a very weak state by injection. The greatest benefit that has been found to arise from injection of any medicine into the bladder was the tincture opii: uva ursi has been much spoken of. A decoction of the garden leek is used, and also the root carefully dried in an oven, and powdered. It is in those cases where the bladder is very irritable, accompanied by a diseased secretion, that most surgeons decline operating.

ON THE SITUATIONS AND SYMPTOMS OF CALCULI.

Urinary calculi have been found in five different situations; first, in the kidneys; secondly, in the ureters; thirdly, in the bladder; fourthly, in the urethra; and fifthly, in the prostate gland, arising in two several ways, either by passing from the bladder, or originally formed in the gland itself.

When in the *kidney*, it is known by pain in the loins opposite to the kidney affected; this is increased by pressure or bending the body, as in stooping, &c.; but if the stone be not large there is a peculiar sensation felt as if something were rubbing in the loins of the affected side, occasioning a considerable degree of uneasiness. When any considerable exertion, or exercise is used, exacerbations of pain come on in consequence of the existence of inflammation, attended with profuse sweating, nausea, and frequent vomiting. A benumbed sensation is extending from the kidney across the abdomen to the umbilicus: there is also a paleness or sallowness in the countenance. If the pain be excessive, it extends to the opposite loin. The urine is rather diminished in quantity, and there is often observable during the violent pains, not only a difficulty in making water, but a good deal of blood discharged and mixed with it: this bloody appearance, however, is known to take place after violent exercise on horseback, independent of calculi. A calculus in the kidney will sometimes cause suppuration of the latter. The abscess has been described, as pointing towards the loins, and that the stone might be easily felt; for the purpose of extracting it, an opening has been advised to be made. Inflammation will sometimes produce an adhesion between the kidney and the colon, in consequence of which, during the suppurative stage, a communication takes place between the two, and the stone will be voided by the rectum. When calculi form in the kidney, their situation is most frequently in the infundibula. In cases, therefore, where they have long existed in this viscus, they commonly take on the form of the pelvis and infundibulum. Their texture is laminated, and is a substance mostly made up of uric acid.

The circumstance of calculi forming in the *ureters* is, comparatively speaking, rare. I have heard of but three instances of it in the dead subject: in the living there are many characterizing marks of the existence of the disease. The symptoms are, pain felt in the hip, thigh, and leg of the affected side immediately on the existence or entrance of the stone: as it gets lower, the thigh becomes painful along the course of the anterior crural nerve, which is united to the nerve going to the ureter by the spermatic plexus: as the stone descends still further, pain and contraction of the spermatic chord takes place from a spasmodic contraction of the cremaster muscle, which draws up the testicle to the abdominal ring. In addition to these, a tingling sensation will be experienced at the end of the penis; in fact, I believe there are very few cases occurring where stone is present in which this does not happen: the urine is sometimes retained, producing ischuria, or when discharged, it is either accompanied with blood, mucus, or pus. It mostly (if not too large) descends into the bladder. Many instances have been known where it has remained in the ureter at its lower part.

The best *treatment* in these cases will be to put the patient in a warm bath, and give doses of opium repeatedly, especially if the pain and irritation be violent. The patient should drink freely of soda water, and the state of the bowels will require particular attention, and castor oil will be found very advantageous, also warm clysters, as they act as fomentations to the part.

As soon as the stone has passed into the *bladder*, the symptoms are nearly the same as when originally formed in it. The first thing the patient feels is an excessive smarting sensation about an inch in the urethra, opposite the frænum; this is very unlike what a person experiences from slight causes; the pain is exquisite, so as to be compared to a red hot iron instrument applied to it, and the patients will declare, after they have undergone an operation for the extraction of stone, that the pain excited by the latter is by no means equal to the former: there is seldom any uneasiness felt in the bladder itself, and it is only when the disease has long existed, that it takes place there and above the pubis.—The pain is much increased on any agitation of the body, as in stepping from one place to another suddenly. When the bladder is in an irritable state change of posture will add to it, and even the riding in a carriage is not easily borne, much less riding on horseback. There will be a bearing down of the rectum if the pain be great, so much so that the patient is unable to void his urine without at the same time going to stool. The urine is in most cases perfectly limpid, but in quantity less: after exercise, blood is commonly mixed with it; this appearance goes off by the patient's remaining at rest: during the discharge of urine the pains are increased more and more as the evacuation draws to a conclusion, and still more so after the whole is passed, from the bladder contracting on the stone. This circumstance will tend in a great measure to distinguish a stone in the bladder from an irritable state of it: for we find in the latter case the very contrary happens, viz. the sooner the water is discharged, so in proportion will relief be found. During the passing of the urine there is often an interruption to its flowing regularly, and it stops of a sudden. It is discharged also when in as relaxed a posture as possible, and this is principally effected by relaxing the abdominal muscles, therefore it is, these patients are found bending their bodies forward, resting upon their arms, &c. so that when a surgeon has once seen a patient in this situation, he cannot hesitate a moment about the nature of the disease, when the other symptoms are also present. In the advanced stages of the disease the urine becomes of a ropy purulent appearance, indicating a diseased state of the mucous membrane lining the bladder. A spasmodic contraction of the abdominal muscles is now taking place, attended with violent rigors, succeeded by heat, and profuse sweating, similar to the paroxysms in an intermittent fever. The bladder of one who long has been the subject of calculus is much contracted in its dimensions, and less capable of retaining its proper quantity of urine: this state of the bladder, even if it were satisfactorily ascertained, previous to the operation, yet ought by no means to prevent its being performed, as many cases of this kind turn out extremely well: the only thing to be observed is a more particular care in passing the gorget, or whatever other instrument is used, as it is somewhat more difficult to operate. When the irritability is great, inflammation and suppuration of the internal coat is the most probable result; the ureters and kidneys participate in the irritation, the patient loses his rest and appetite, and becomes emaciated and exhausted, and death finally closes the scene.

It would appear that the most frequent and indeed principal proximate *cause* of the formation of calculi, is an excess or superabundance of uric acid, which becomes deposited from a peculiar disposition of the fluids. It is also thought, that the tartar contained in wine may be the cause of calculous matter occasionally; so also may be enumerated water, if it contain sulphate and carbonate of lime in excess. Some assign hereditary predisposition—sedentary employments, as well as the long and free use of spirits, as tending to these formations.—The particles of calculous matter are easier evacuated in warm climates, from the relaxed state of the passages, than in the colder, so that these concretions are seldom found there of that magnitude seen in our own or colder regions. The most frequent period of life for these formations is from infancy to fifteen or sixteen years; and children are the most frequent subjects of operation in the London hospitals, and it appears from attentive observation, that the lower classes of society are more frequently afflicted than the more wealthy, and this evidently may be attributed to the dissimilitude in the purity of the solids and fluids they take. It requires only a moment's consideration to solve the question, Why calculi of some size are more frequent in the male than in the female? It is on account of the greater difficulty in getting rid of them when formed, from the length and narrowness of the urethra.

ON THE PROPRIETY OF LITHOTOMY AT CERTAIN AGES.

When the presence of stone has been satisfactorily ascertained by sounding, the operation is not to be determined on immediately, without the person's age and constitution has been taken into consideration; a neglect of which many operators have been, and are, guilty of. It does not appear that there is any objection to lithotomy in persons advanced in life, if their constitution be in every other respect unbroken; as it has been done with success even at the advanced age of eighty, and frequently between seventy and eighty. The most favourable age is certainly the middle period of life. It is better not to perform it in children *under* the age of *two years*, as they are not able to undergo the operation with that degree of safety as when a few years older. It has once been attended with success in a child only one year and nine months old: however, I should not recommend it as a favourable period, and, indeed, have a great objection to its being done so early, as convulsions, from an unavoidable constitutional irritation, are likely to ensue, accompanied also with coma, &c. which carries them off. It is also requisite to attend to the state of the viscera, for if there be any diseased action going on in any one organ, either remotely or immediately essential to life, I would decline operating, as it will not, by any means, be prudent to do so. This remark not only holds good in early and advanced age, but also in adults, as when it has been done in these cases it was seldom, if ever, the patients did well: it is, therefore, for these reasons, indispensably necessary that the constitution should be perfectly restored to its healthy actions before it is attempted.

Sometimes from a stone in the bladder the kidney is enlarged in some; in others, it wastes in its substance from ulceration: if then the patient complains of severe pains in the loins and a discharge of matter with the urine, after the presence of stone has been ascertained in the bladder, it will be advisable to delay the operation: a similar appearance is presented when there is a diseased prostate, but unaccompanied with the acute pains in the loins characterizing the other. It will be equally improper to operate when there is an ulcerative state of the bladder, which is known by the excessive pain sounding produces, and a discharge of blood mixed with the pus.

Necessary Precautions.

Those who intend to perform lithotomy should be furnished with a case containing every requisite instrument, as well as the proper bandages. There are different kinds of sounds used; they are not to be introduced indiscriminately, but large in proportion to the size of the patient, as without attention to this caution mistakes and affirmations might be made of the existence of a stone, when in reality there is not actually one present. It is also right to sound the patient in an erect, as well as in a recumbent posture, for this reason; if there should be a diseased prostate, the instrument, in an erect, slips over the gland into the bladder, and the stone cannot be felt, being situated behind the prostate, in the hollow between it and the rectum; but it is easily felt in a recumbent state of the body: it should likewise be known by examination when the bladder is full, as well as when in an empty state. These points are of great importance to the surgeon, as his character so much depends upon an accurate knowledge of the presence of a stone in the bladder. Having perfectly satisfied yourself with regard to a stone being present, and there are no objections with respect to the health of the patient, so as to militate against the performance of the operation for its removal, a few preparatory steps are required; and if the patient be of a full plethoric habit, bleeding the day previous to that fixed on for operating, will be right, to a moderate extent, and also the administration of purgative medicines. This mode of preparation is particularly necessary about the middle period of life, and it is owing principally to its adoption that the operation succeeds in the hospitals. But the best step of the kind which may be had recourse to, is that of sounding the patient very often, even every other day for some time: this frequent irritation accustoms the patient to a considerable stimulant, and he will bear the operation with less uneasiness and pain than would otherwise happen; and also by this means the surgeon gets more complete depth in the cut by passing the sound. The morning it is to be performed, it will be right previously to evacuate the rectum by means of a glyster, as it might otherwise be so distended as to be cut with a knife, and the patient should be directed to retain his urine for some hours.

The old Operation.

It is set down by surgeons, as an invariable rule, never to operate for lithotomy unless the stone can plainly be felt, and struck against immediately previous to its performance. The vibrating sensation of the sound against the stone, may be distinguishable by the ear as well as by the feel. I have seen it postponed by Mr. Henry Cline, and others, on this account: although the calculus could be readily felt a short time before, yet on introducing the staff on the morning the operation was contemplated, it could not be detected. Sometimes the stone is protruded through the fasciculi of the muscular fibres, forming a kind of bag by the lining of the bladder, and hence the reason it cannot be felt. If the subject be an adult he is to be laid on a table about three feet high; there are three bandages required, one on both sides for tying the ancles and wrists of each side firmly together, by means of a noose formed in a piece of each bandage; the thighs are then to be separated, and the other bandage is to be applied so as to secure the knees towards the neck, drawing the thighs up to the abdomen; the nates of the patient being made to project a little over the edge of the table, the surgeon is to be seated in a chair before, and rather to the patient's right side; and before he makes his incision into the membranous parts of the urethra, a staff, with a groove in it of a proportionable size, and a little more bent than the sound, is to be introduced, the groove being on its convex part for the purpose of receiving the beak of the gorget; a double-bladed knife is then necessary for the purpose of cutting into the membranous part of the urethra; with this instrument there is an advantage over those in use formerly, as the opening can be made either large or small, or if it be found convenient, the groove in the staff must be laid bare, and the beak of the gorget is to be introduced into it: the staff is then to be taken from the assistant, and drawing it gradually towards him, he is to push the gorget forwards in an horizontal direction until it has entered the bladder, which is immediately known by the escape of urine and the percussion of one instrument against another. The staff is now to be withdrawn, and a pair of forceps introduced along the groove of the gorget; move them about till the stone is struck against, when the blades are to be opened cautiously, and the stone grasped at the least diameter, which will be known by the expansion of the handles of the forceps; it must then be extracted under the arch of the pubes, inclining it rather downwards. If the stone be too large to pass the angle formed by the rami of the ischia, a strong forceps, contrived for the purpose, must be passed up, so as to break it into pieces.

The gorget has been mostly in use till latterly, and some considerable improvements have been made in its shape, and the last of all by Mr. Cline, who was for years considered the best lithotomist in England, and used no other instrument than this in finishing the operation. Not only Sir W. Blizard, but more lately Mr. Astley Cooper, has made an alteration in this respect, and substituted a knife, which, as well as I can judge, is not only more simple, but far preferable to the gorget, as the latter is apt to divide the internal pudendal artery, which, however, in old people, does not produce any great hæmorrhage, and is very generally stopped without much difficulty: it is as well notwithstanding to avoid doing so. It is from other disadvantages that the knife has obtained the preference, and which, as far as I have been able to learn, has been attended with great success, the fatal cases being but one in twenty. The greatest superiority it possesses over the gorget, is, that it is by no means so liable to slip between the bladder and rectum; a circumstance which would be fatal to a professional character. The knife I last saw Mr. Cooper use, was exactly similar to a probe-pointed bistoury, with this difference, that there is a beak at its end, and in using it, it should be passed along the groove in the staff into the bladder, and then make the cut as it is drawn out again, so as to allow of the stone being extracted.

New Method of operating.

Having properly secured the patient, as already described, on a table of convenient height, the surgeon seated, and the staff introduced, which must incline a little to the left side, so as to rest upon the stone; it must be kept in this position by means of an assistant: feel for the symphysis pubis, and make the incision an inch below, and opposite the arch of the pubis; and as it would be perfectly unnecessary, it should not be too near the scrotum, but rather on the left side of the raphe, as inflammation would most likely take place, which would end in mortification and sloughing of the parts: the incision is to terminate in a line near the middle of the anus, between it and the tuberosity of the ischium, having been carried in an oblique direction downwards and outwards; this exposes the bulb of the penis, which is covered by the accelerator urinæ muscle. The next incision will be through that muscle, when the bulb will lie bare; continue it, a little below, and on one side of the bulb, or rather betwixt the bulb and the crus penis—then with one finger of your left hand, press the bulb towards the right side of the patient—then divide the transversalis perinei, the transversalis alter, and also the artery which goes to supply the bulb, which is a branch of the internal pudendal; the division of it is readily known by the stream of blood flowing out: then feel for the staff, which is laid bare in the membranous part of the urethra, and with the fore finger of the left hand, carry it up to the groove in the staff—now take the latter in your own hand, and bring it forwards, so as to rest it against the arch of the pubes; by this means the knife will readily slip along the groove into the bladder, keeping the staff in the same situation till you have made your cut into the bladder, which is to be done by drawing out the knife, and this divides the prostate laterally, when the staff is to be withdrawn. Having passed in the forceps, and laid hold of the stone, it is not to be extracted with violence, but rather wait a moment until the muscles are a little relaxed, and if any resistance be found in the beginning, turn the forceps round, and by gently moving it about until the stone is laid hold of at its smallest diameter, endeavour to extract it gradually; if this do not succeed, introduce it a second time: if the stone be of a soft texture, a scoop must be used: on the 18th January 1810, Mr. Cooper operated thus, and extracted thirty-seven calculi, of a tolerable size, from a gentleman. When the stone is very large, Mr. Henry Earle has constructed an instrument for breaking it in the bladder.

Subsequent Treatment.

The legs of the patient are to be bound together by passing a bandage around the thighs; the simpler the dressings to the wound the better: he is then to be laid in bed, and a dose of opium given. If the internal pudendal artery have been divided, it may, in general, be stopped by pressure; but should it still bleed copiously, it will be right to introduce a piece of firm sponge, perforated through its centre with a canula, by the expanding nature of which, when it imbibes moisture, the hæmorrhage will be stopped.

Peritoneal inflammation is the cause of death in most cases from this operation; and hence, if the abdomen become swelled, tender, and painful, bleeding must be had recourse to, both locally as well as generally; fomentations may be used, immersion in the warm bath—a blister will be advisable if the pain and tenderness continue: doses of castor oil, or emollient glysters, should also be administered.

ON LITHOTOMY IN FEMALES.

Women are much less liable to calculi than men, and the reason appears to be, that from the short, and almost straight course of the urethra, they are more apt to be carried off by urine.

The first symptom of stone in the bladder, is a burning heat felt at the extremity of the meatus urinarius; also an excessive bearing down of the uterus, with frequent inclination to go to stool: in other respects the symptoms are similar to men. Women will sometimes pass calculi of great magnitude, even in some instances so large as from two and a half to four ounces. I remember once a very singular case related, where a large stone in its passage through the meatus, stopped half way, and forced a cavity for itself, one half in the meatus and the other in the vagina, and the surgeon who operated was under the necessity of introducing his finger per vagina to extract the stone, and on examination it was found to be nearly of an equal size in the meatus and vagina; that is, it was half in one and half in the other. As impositions often occur, it is necessary to be on our guard. Several cases could be detailed bearing on this point. In one, on examination, a pebble was extracted: in another, a young woman was admitted into St. Thomas's Hospital, having, as it was supposed, a retention of urine; the deception was carried on for some time, and at last it was agreed that an operation should be performed; accordingly she was brought into the theatre for that purpose, and bound as usual. On Mr. Cline's introducing the sound, he thought that he perceived something between the stone and the bladder, and having examined again, he was further convinced of it: on this he introduced his finger per vagina, and extracted successively nine pieces of coal. These are merely detailed to put operators on their guard. Women with diseased ovaria are most prone to these kinds of impositions.

It has been mentioned by different authors, that the meatus urinarius is capable of being so mechanically dilated, as to give free access to the bladder, for the purpose of extracting the stone, without having recourse to the knife: this is done by means of a sponge tent. It was indeed some time ago noticed by writers on this subject, but was never carried into execution till a Mr. Thomas had recourse to the method in a lady, who had, some way or other, contrived to introduce an instrument used for the ears into her bladder—after a sponge tent had been suffered to remain for a few hours, the urethra was so dilated as to admit of an easy extraction. By continuing the dilatation in this manner still further, a very large stone might be extracted. It is from the dilatable nature of the meatus, which allows calculi of considerable size to pass, that the operation in them is much less frequently required than in men. Various other means have been employed to dilate the passage, as gentian root, the gut of different animals, and eel skin. When a portion of gut is used, it is to be introduced into the meatus in a collapsed state, then gradually enlarging it with warm water, it may be withdrawn. Many contrivances have been proposed besides, but as they are intended to act on the same principle, it will be unnecessary to state them. There are objections started to the employment of these means, but I think very unjustly; such as the length of time sacrificed, being insufferably tedious and painful to the patient—and the incontinence of urine occasioned by the requisite distention: with respect to the first objection, it is found in practice not to hold good, generally speaking; and as to the second, the operation for lithotomy would be much more likely to produce it.

Operation.

Having properly secured the patient by bandages, the male sound is to be introduced into the bladder—some use a straight staff, or one nearly so; the groove of the staff is to be turned downwards and outwards obliquely, towards the left side, in which direction the incision is to be made, and not horizontally, as being too near the arch of the pubes; then pass a probe-pointed bistoury, or gorget, along the groove in the staff into the bladder, taking the staff in the left hand to serve as a guide; these instruments are immediately to be withdrawn, and you are presently capable of feeling the stone: introduce a pair of forceps rather curved—the reason for the curve is, that the stone is mostly situated on the upper part of the vagina, behind the meatus. In passing the forceps, depress them at the part where the handles unite, as much as possible with one finger, as this will greatly facilitate the stone being raised from under the pubis: if there be any difficulty found in extracting it, pass one finger up the vagina and tilt it into the bladder, and then it will easily come away.

Incontinence of urine often takes place subsequent to the operation; to remedy which, Mr. Hey of Leeds has proposed a very ingenious method, and one which he has practised with success. The principle of it is to introduce a substance into the vagina, for the purpose of pressing upon the cut wound after the operation, in order to produce an adhesive inflammation of the sides, and render the meatus urinarius of its original size; this is to be attempted as soon as the healing process has begun; the woman is directed to draw it out when she wants to void urine. It has been thought very highly of in the profession.

STONE IN THE PROSTATE GLAND.

There are two kinds of calculi found; one originally formed in it, the other passing from the bladder and lodging in the urethra within the prostate. The calculi generally found are small, and their composition appears to be chiefly phosphate of lime; they are situated between the follicles of the prostate, several of them emitting from a bag, which is easily felt per rectum.

In the Urethra.—Calculi are found situated in three different situations in this canal; but chiefly in the membranous part, at the place where the bulb of the penis commences, and which, by being so narrow, is often entirely choked up by them. When called to a patient labouring under the symptoms of stone in this part, and which will readily be ascertained by introducing a catheter, which would naturally be resorted to in the first instance, for the purpose of relieving the patient of a retention of urine: if a stone be discovered in the urethra, be careful not to pass the catheter any further, for fear of pushing it back into the bladder: the best plan will be to pass the largest sized bougie as far as the stone, suffering it to remain there until such time as the patient becomes distressed on account of the bladder being greatly distended with urine, and is under the necessity of trying to void it, to relieve himself: at this time withdraw the bougie, and direct the patient to pass his urine immediately, and the chances are that the stone is discharged at the same time; but if it be too large to allow of this being accomplished, the operation must then be directly resorted to, which is similar at first to that already described for lithotomy, with *this precaution*, that the finger must be introduced, at the time of operating, up the rectum, otherwise the stone will certainly be forced into the bladder, and thus render the operation an extremely difficult one.

When a calculus is situated opposite the scrotum, and an operation is thought advisable, it would be *improper* to make an incision into the scrotum for the purpose, as those parts are so liable to subsequent inflammation and sloughing.

The manner then in which the extraction is to be accomplished, is by first pushing the stone a little behind the scrotum, and then making the incision upon it into the urethra, taking care that the external opening is sufficiently large, as a great deal of trouble will otherwise be occasioned afterwards; and not only here, but in the first instance, there will be a great impediment, if not altogether frustrate the performance of the operation satisfactorily. There is a further objection against opening through the scrotum, which is, that after this is done, there is almost an impossibility of withdrawing the stone; but by the other mode it will be very easily accomplished, if the external opening be made to a proper extent, taking care that the incision is continued quite down to the stone, which may be extracted by laying open the corpus spongiosum.

LECTURE XX.

ON DISEASES OF THE TESTICLE.

There are *four* diseases which the testes are liable to, and which *require* the operation for their removal. The *first* is of the *hydatid kind,* where cysts are formed in the substance of the testes; it mostly occurs to people from the age of thirty or forty to forty-five, seldom exceeding that period. An enlargement first takes place in the external part of the epidydimis—the continuation of it is downwards: its progress is slow and gradual, and at last affects the whole substance of the testicle, and then extends to the vas deferens; but never, as far as I can ascertain, so as to disease the spermatic chord, which is free from it, its vessels being only a little enlarged, and consequently it does not extend to the abdomen. This disease is unlike all others to which the testes are liable, and the patient is not subject to any future danger after an operation, from extension.

On examining the scrotum after the removal of the testis, the veins are observed to be in a varicose state, distinguishing it from the affections of the testis; and on cutting through the scrotum, the veins of the tunica vaginalis will be found to exceed in size those of the former. The scrotum is not at all inflamed, having no redness or blush on its surface: there is a greater determination of blood to the testis than in an healthy state, and therefore the chance of hæmorrhage, after an operation, is greater than in other diseased testes. A fluctuation is always perceptible—and this, with many other similar symptoms, may lead, without cause, to the supposition, that the disease is hydrocele: but the distinguishing marks are these—in an hydatid testicle, the fluctuation is confined to *one part* on applying the fingers, and is not communicated to the feel *generally*, as in hydrocele, when on striking or pressing it in any part the fluctuation is felt at a distant spot. Besides, in the hydatid testicle it yields like dough, or similar to anasarca. When there is a doubt, however, by applying a lighted candle it will *not* be observed to be transparent. *Its weight* also is much greater than that of hydrocele, and of a more *solid* texture. The form is not pyramidal, as that of the testes is much preserved, and a distinction can evidently be discovered between the latter and the epidydimis. To remove all doubt on the subject, it will be right, previous to the performance of any operation, to make a puncture with a lancet, and if no fluid escape, then there will be no hesitation as to its nature; and it may be right here just to observe, to prevent the injury of a person's character with respect to a false opinion delivered as to the nature of the disease, that when a professional man is asked by the patient respecting a complaint of this kind where any difficulty exists of ascertaining it, to give him an indirect answer; and I should always make it a rule to puncture with a lancet before I would castrate any disease of the testicle, as since there will be every probability of its removal, this small opening cannot injure it, and yet it may sometimes prove of great advantage. I remember a case related during my attendance in town, where a surgeon of skill in his profession had removed the testicle, and on examining it afterwards, found that there was rather an obscure hydrocele in the vaginal tunic; so that here the testicle was unnecessarily extirpated, and might have been prevented by only attending to the preceding precaution.

The operation for removing the hydatid testicle becomes necessary from its great size, though the disease has not extended to the abdomen: on examining it after extirpation, a number of bags or cysts are found on the side of the testis of various sizes, and the state of the fluid is always very different, sometimes of a yellowish colour and ropy, at other times inflammation has gone on to suppuration: the coats of the cysts are extremely vascular.

The *second* disease of the testes that I shall remark, is the *scirrhous:* this is very rare, and the examples of it, in an extensive practice, have been very few. It begins in the body of the testicle, and the edges are much more hardened than in the centre, the whole composed of coagulable lymph. It gradually and slowly proceeds through the body of the testicle, and extends to the epidydimis throughout its whole course; the spermatic chord becomes hardened, and the disease extends along its course till a swelling is produced in the loins. This disease being slow in its formation and progress, may be prevented from extension, by an operation before it has reached the spermatic chord, which may be known by the strong hard feel it assumes when affected—and this, in a great measure, distinguishes it from other diseases. In every case that has come to my knowledge, it was complicated with hydrocele; and when the water was drawn off, the testis presented a marbly feel: it occurs in old people after the virile powers are lost, generally about fifty years of age. There is great danger in operating when the spermatic chord is affected, from inflammation extending into the abdomen, besides the liability of its being, at the time, in communication with the glands in the loins. On cutting open a scirrhous testicle, its appearance is uniformly white, being full of coagulable lymph, perfectly solid: bony matter is sometimes found within a cartilaginous substance.

The *third* disease, that I now come to, is what, till a few years ago, was called the *pulpy* testicle, of a cancerous nature: Mr. Wardrop, Mr. Hey, and others who have written on this subject, have described it under the name of *fungus hæmatodes.* It begins at the external part of the epidydimis, at that part where it is applied to the testis; or, anatomically speaking, in the ræti, near the vasa efferentia. In the first place, coagulable lymph is thrown out, mixed with blood, in the tubuli semeniferi, perfectly distinct from the body of the testicle. The disease soon makes its progress through the body of the latter, owing to the rapid absorption taking place in this disease more than that of scirrhus, the substance being applied to the mouths of the absorbents from its softer texture. Wardrop describes its progress as slow, with no severe pain attending it—no inequality or hardness is perceptible—no change in the scrotum: as the disease increases, it gets soft and elastic, and has that pulpy feel, from whence the name originally was taken. This mass, it would appear, is composed of lymph, pervaded by a great number of vessels, differing from other similar deposits in this respect, that it is much softer, and less capable of resisting the impetus of blood. It is a most mistaken notion to imagine, that it is an unorganized mass, for it is the contrary. The equal surface and deceptive feel of fluctuation which it presents in the more advanced state, has misled a surgeon to imagine it to be hydrocele, and it was punctured with a trocar; but in fungus hæmatodes the testicle gradually enlarges, then the spermatic chord, and by the disease extending along it, the inguinal glands, which acquire an immense size. On examining the spermatic chord, several tumours are found around it of the same structure as that of the diseased testis—so even of the inguinal glands, and of the absorbents, even to the thoracic duct, which has become obstructed in the more advanced stages of the disease, and a pulpy medullary substance thrown out on its forming a tumour. It has been supposed, that from the rapid progress of the disease when once formed, it is impossible to operate with any rational prospect of success; but this is not altogether true, as in the *very early stages* of the disease, it may be attempted. This melancholy disease occurs more frequently, it is said, in *young subjects* than those more advanced in life. I presume I have said already sufficient to convince the profession, that on the very early performance of the operations, rests the probability of cure; and I should consider it hopeless if deferred till the spermatic chord was affected along its course—should this be the case, and the inguinal glands also, the less the surgeon does the better, for death is inevitable.

The *fourth* disease of the testis, is that of a *scrofulous affection* in the anterior of this organ; a person who has received a blow on this part may be liable to it, if his system be so disposed already from subsequent inflammation, extending to the labuli, and instead of lymph, curd-like matter mixed with pus has been found on dissection: a considerable enlargement takes place in the testicle and epidydimis; and as the disease is slow, and does not extend by absorption, an operation will be attended with success.

There is *another* disease liable to affect the testes, and which requires an operation, although not for the entire removal of the testicle: it is that of a *fungus* projecting from it. Castration here is not necessary, as exposing the patient to unnecessary danger and deprivation. All that is requisite to be done is, to make an incision down on each side of it in the scrotum, and divide the fungus at its neck: then bring the scrotum together by a ligature, and apply a poultice, &c. to subdue the excess of inflammation. There was a case some time ago at Guy's Hospital, where the surgeon removed the testicle completely, and the consequence was fatal.

ON CASTRATION.

Shave the hair off the pubis; make an incision from the upper part of the abdominal ring, and continue it down to the bottom of the scrotum: by extending the incision to the lower part of the scrotum, matter is prevented from accumulating there during the cure: then, if a puncture have not been previously made with a lancet, (which ought, *in the first instance*, cautiously to be done) cut through the tunica vaginalis, and observe if there be any water or fluid contained: having done so, lay bare the spermatic chord perfectly at the ring: if the chord be hardened, expose it about an inch higher in the oblique canal: as soon as this is done, direct an assistant to take hold of the chord between his finger and thumb, keeping it steady, then divide it, and drawing the chord to you, detach the cellular membrane behind it, which is easily removed: then take up the spermatic artery and that of the vas deferens with a tenaculum, and secure them by ligature. The external pudendal artery, and also some other small branches which enlarge under disease, will perhaps require securing. Surgeons formerly used to pass a ligature around the whole chord very tight, but this has now very justly been laid aside, as it was altogether unnecessary, and gave such excessive pain.—The testicle is easily detached.—After the operation is over, the edges of the wound are to be brought together. Some use sutures; but adhesive plaster will mostly be sufficient, aided by compresses and a T bandage:—if there be much inflammation, the saturnine lotion must be constantly applied. The artery of the septum as well as smaller branches that become enlarged by disease require securing, otherwise hæmorrhage would come on.

The testicle sometimes becomes amazingly enlarged, even to the weight of several pounds; here it will be obvious an elliptical portion of the scrotum must be cut out, and this must vary in extent according to the size of the whole.

ON CHIMNEY SWEEPER'S CANCER.

This disease is denominated the soot-wart. It appears first in that form on the inferior part of the scrotum, and extends until an ulcer of some size forms under the crust, which becomes ragged, with the edges elevated, hard and scirrhous: then it takes on the nature of the true cancer, having in the centre a fungous kind of excrescence, the surface freely bleeding. It is not confined alone to the scrotum, but the membranes lining the testis, as well as the testicle itself, become ultimately affected by it, and also the inguinal gland, and it continues its progress until some of the viscera get diseased. The cause is derived from the lodgment of soot in the rugæ or folds of the scrotum, and it is confined to chimney sweepers; so that it is brought on them by their occupation, and from the want of sufficient cleanliness. Mr. Pott remarks, it is not only rapid in its progress, painful in all its attacks, but most certainly destructive in its effects. It is seldom, if ever, seen under the age of puberty.

The treatment consists in the early extirpation of the disease before the habit is tainted: if the testicle be affected already, the operation will be too late. The operation consists in carefully dissecting that part of the scrotum out where the disease has commenced its ravages, and the subsequent treatment will be to effect union by adhesion of the wound.

ON TIC DOULOUREUX.

Tic Douloureux is a peculiar affection of some particular nerves distributed to the face. The ophthalmic, a branch of the fifth pair, is often the seat of it—the portio dura of the seventh pair, not unfrequently; and this is the very worst situation of the disease, as admitting of no relief as far as I have heard:—but the most common seat of tic douloureux, as it is named by the French authors, is in the sub-orbitar nerve. This disease is attended with pain so excessive as scarcely to be borne with; and even persons possessing great vigour of mind cannot refrain from expressing the constant anguish under which they labour. The pain which they complain of is similar to an electrical shock, causing the patient to start: it is brought on by the most trifling cause, such as jolting in a carriage, or taking of food.

Prior to the disease being well understood, it was the custom of practitioners to extract several teeth; but this was found never to give the least relief, and the only method of affording ease and effecting a cure has been thought to be by dividing the nerve: the radial, the sciatic, and also the tibial nerve have been known to be affected with this disease, and also an instance has occurred where the lingual nerves and the gland were affected.

One of our best surgeons thinks medicine has but little influence in eradicating it, and the only thing of the sort which this gentleman has seen of service was a copious application of a solution of arsenic combined with potash. Practitioners had formerly recourse to salivating the patient, and a few cases are related where it succeeded: but as far as I have been able to ascertain, there has been no good effects resulting from the use of mercury. Mr. Abernethy considers it to proceed from a derangement in the digestive organs, and he has seen the carbonate of soda of very material service in this affliction: probably it neutralizes the acidity in the stomach: great attention should be paid to regimen, exercise, change of air, &c. to effect permanent relief. The carbonate of soda should be swallowed a little at a time. Mr. Abernethy had drank "just as much wine as would do him good," and in the night was troubled with heart-burn; he recollected having some of the carbonate of soda in the room, and dissolved, possibly, as much as two scruples or more in water, which he drank; but to the last day of his existence he will remember the consequences; his stomach was distended amazingly, as if he had been blown up; he was not relieved till the disengaged gas, which had so enlarged his stomach, gradually escaped.

Mode of Operating.

The method of dividing the nerve, should it be determined on, is thus; supposing it to be the sub-orbitar, feel for the under edge of the orbit, and half an inch below and opposite to the middle of it is situated the foramen, through which the nerve passes, then carry into this foramen the point of a sharp-pointed bistoury or phymosis knife down the bone under the nerve, then lifting up the point of the knife, in drawing it out, the nerve is completely divided; to be certain of which, however, inquire whether the patient feels a numbness or not on the side of the nose and upper lip; if so, then we may be assured it is effectually done; but if, on the contrary, he does not, then it may be necessary to divide another small twig arising from it — a trifling hæmorrhage commonly takes place. The ophthalmic branch is to be divided thus: this nerve passes near the inner extremity of the upper eyebrow—the knife is to be directed for the upper and inner edge of the orbit, and in withdrawing it the division is effected.—If the inferior labial nerve, the bistoury must be passed on the inner side of the mouth between the gum and the teeth. Alum dissolved and taken into the mouth will afford in this case some degree of relief. In a case where the anterior tibial nerve was affected, caustic was used with complete success, not by dividing the nerve, but irritation produced on the skin. When the portio dura of the seventh pair of nerves is the seat of this disease, the operation is of no avail, as the branches are so numerous on the face; but for the preceding situations it is sometimes successful, although in the majority of instances I think it is not so; and I have known the pain recur before the numbness had ceased, which commonly takes place in about three months. Tic douloureux seldom occurs in infants.

ON AURA EPILEPTICA.

The singular affection, which has obtained the above name, is very similar to the preceding disease. It is commonly supposed to have its origin in the particular nerve of a part, but from what I have seen, and especially from the history of a case which occurred in Guy's Hospital, I am of opinion that it has its origin in the brain. The person who at that time laboured under this complaint was about twenty-four years of age: a peculiar kind of tingling sensation came on generally in the evening in the thumb, which extended up the arm along the course of the radial nerve, until it reached the shoulder, when a violent epileptic fit immediately took place, which commonly lasted above half an hour. After it was over the patient appeared as well as ever, and his appetite equally good. It was conceived, that by dividing the radial nerve at the part where he felt the first sensation, that the complaint would have been eradicated, and accordingly five-eighths of an inch was dissected off; but it was not attended with any degree of success; and what is very singular, he felt the same sensation in his thumb as before: having, therefore, given it a fair trial, and not attained the wished for success, the conclusion was drawn that its origin was in the brain, and not in the particular nerve, and there would, in any future case, be a doubt of the propriety of any operation: the only method that could be rationally adopted would consist in regularity in diet, exercise, change of air, &c. and the exhibition of the carbonate of soda.

Mr. Abernethy removed half an inch in length of the nerve going to the ring finger of the left hand, in the case of a lady afflicted with tic douloureux in the integuments under and near the inner edge of the nail of her finger. The skin, &c. recovered its sensibility in three months in a great measure, but relief was not afforded to the extent anticipated. The part had been previously cauterized.

LECTURE XXI.

ON DISEASES OF THE BREAST.

The breast is subject to a variety of tumours, and not confined, as was formerly supposed, to one, i. e. scirrhus; which I think the most frequent of all.

The first that I shall commence my description with is that of the HYDATID kind, where there are a number of little bags or cysts formed. The first appearance that it presents, is a tumour on the part, occurring in people apparently of good health; unlike that of cancer, in the constitution being but little affected: it is about the size of a pea, and yielding on pressure, but elastic and returning to its former size when that pressure is removed: in this state there is but little or no pain; it begins often in one part of the breast, and at another at some distance, so that the intermediate space is not diseased; but this does not long continue, as the whole substance of the breast soon partakes of it: suppuration next ensues, and a great deal of pain is now felt, and if the inflammation have long existed the tumour will burst, and a glairy fluid, or inspissated mucus mixed with a small quantity of matter will be discharged. A cyst thus opening remains in a sinuous state, and a fluid is constantly secreted: then another cyst inflames and terminates as above, and so on, from one to another: if the case were to be left to itself it would take some time before a complete sinus of the whole took place. No ulceration is found in the parts around. It is confined entirely to the glandular substance of the breast; —the axilla is never found affected, which shows that there is no absorption taking place.

Treatment.

When there is only a single tumour formed, and that very large, the best method of treatment is by injecting astringent lotions, as in hydrocele, so as to produce adhesive inflammation, and an union of the sides of the cyst: but when the cysts are numerous, we must have recourse to the removal of the breast.

The second disease is A SCIRRHOUS STATE OF THE BREAST.—It most frequently commences with a small sanious discharge from the nipple: if it be situated at some distance from the nipple, the patient feels great uneasiness in moving the arm backwards, so as to put the pectoral muscle on the stretch.

The distinguishing marks of this disease, are its stony hardness to the feel; and its being perfectly circumscribed, so that the surgeon can distinctly feel its whole extent and limits unconnected with the other parts. It is at first very moveable, having its attachment either to the pectoral muscle, or to the integuments; the pain in this disease is not constant, but attacks the patient all of a sudden and with great violence, so much so, that he compares it to a hot iron applied to the part: it is not confined to the breast alone, but extends along the axillary plexus of nerves: as the tumour increases in size it adheres to the skin, which may be known by the latter being puckered, having the appearance of a cicatrix. The cellular membrane sometimes partakes of the disease, and here the whole breast from the first instant feels of a stony hardness: from which it would appear that a cancer extends beyond the glandular parts.

The glands in the axilla soon become enlarged. On opening the part four or five have been commonly discovered much increased in size, although not one could be felt externally. The glands also above the clavicle, just at the point where the subclavian and jugular vein unite, are commonly diseased. The next course the disease takes is to the intercostal muscles, and below the cartilages of the ribs. In true scirrhus inflammation is attempted, but it does not last long; a purple part around the tumour is formed, which bursts, and granulations are seen springing up, but different from those of other parts, as they are uniformly irregular: in some places deep depressions are seen, in others, projections like fungus shoot out from the rest. In this state of the disease the pain is not only more constant, but more severe; although it is not very tender to the touch, and the application of the necessary dressings to the part excites but little sensibility.

A very characteristic mark of this complaint, and one which serves to discriminate between it and other affections of the breast, is, a white inverted edge around the wound, which is of extreme hardness, owing to coagulable lymph being effused: there is frequent hæmorrhage, and from it the patient always experiences a degree of relief. The disease is very slow in its first stage, and in the ulcerative process, so that a patient may exist many years with no open cancer; this, however slight, is some consolation for patients to know, when there is no chance of affording relief by an operation. When about to destroy life, it does so by its effects on the arm; the glands being enlarged, by their pressure on the blood vessels, prevent the free return of blood; a great tumefaction therefore takes place, and commonly an erysipelatous inflammation: if in this state of the disease a puncture be made, the fluid discharged will presently coagulate. The tumefaction, together with the frequent hæmorrhage, soon destroys the patient by producing great prostration of strength. In true cancer the disease is much slower in its progress than when it does not assume its regular form.

A cartilaginous substance is most commonly found, on dissection, within the breast, very rarely any earthy matter. The disease mostly occurs in advanced periods of life, very seldom under thirty-five years of age; mostly from forty to fifty; and it has been seen to occur above the age of seventy. When a tumour, apparently of a cancerous nature, takes place before the age of thirty-five, suspicions may rationally be entertained whether it is a cancer or not; as, generally speaking, it is rarely malignant before that period. The operation has been frequently performed, I am sorry to state, when no such disease actually existed. It is at that period when the menses cease (which is considered critical to women) that cancer most often occurs. It is also found to take place in particular families. Blows are to be reckoned among its principal causes, and it mostly happens in constitutions predisposed to the disease from particular irritability of fibre, which effects this disposition: for I would allege, that where this peculiarity of constitution did not exist, and the patient healthy, scirrhus would not be the result of a blow: so it is with scrophula, and I believe that if a person enjoying good health in every respect, were to be inoculated with the poison of cancer (if there be any such) it might be done with perfect safety. A case, however, has been related, which, without attending to the description carefully, would lead to a disbelief of the preceding remark. In this case it is said, that a young woman having drank out of a cup in which the matter of cancer had been accidentally put, had a cancerous breast some years afterwards. I must confess I am not inclined to credit the assertion.

Unmarried women, and those who have never borne children, are more the subjects of cancer than those who have had a family and suckled each at the breast: for it is necessary that the breast, as well as other secreting organs, should, at its proper period, perform the necessary functions it was originally destined for; if then this be suppressed, the constitution becomes more liable to take on a predisposition to disease, which a trivial circumstance might afterwards call into action. Ladies of the haut-ton will not relish this principle much, I imagine: but if they were to abandon the erroneous opinions of interested accoucheurs on this subject, however grateful to the gratification of their amusements unrestrained by maternal ties, their offspring would be more likely to thrive, and they would be amply rewarded by being rarely the subject of this lamentable disease.

The *operation* for the removal of the breast is one of the simplest in surgery. First, make a semi-lunar incision above the tumour, between it and the axilla, quite down to the pectoral muscle, in doing which the mammary vessels sent off for the nourishment of the breast, are necessarily divided; then direct the assistant to make pressure with his finger on those two vessels, which will allow the operator to proceed with more precision. The next incision is to be made in the same semi-circular form below the tumour, so that the two points of each may meet. Many practitioners advise saving as much skin as possible; but there is a degree of care required here, lest any diseased portion be left behind, which would render the operation entirely nugatory; therefore, if any portion of skin be found adhering to the cancerous parts, it is better to remove it, and trust to the vacancy thus occasioned being filled up by granulations. Let both the incisions be carried down to the pectoral muscle, and dissect out the tumour close to the latter, so as to lay it completely bare, removing even the fascial covering, for if this be not minutely attended to, there will be a very great probability of the disease returning, or, I may say with more propriety, remaining.

It is not always to be expected that this simple operation will be successful, for it sometimes happens from certain affections of the mind, that the patient does not long survive it, especially when it is connected with any visceral disease; and I should invariably make it a rule not to operate when this could be ascertained to be the case. The glands in the axilla, if enlarged, are now to be cautiously removed, together with the intervening substance, as the leaving the latter would be the future cause of a similar disease being produced. I am, however, of opinion, that when the glands in the axilla are diseased, that the operation is useless, as I never saw it in these cases attended with any benefit, and therefore I should advise, in case they are found on examination much enlarged, not to operate. After the breast is removed, look carefully for the vessels; if the tumour be small mere pressure will do, but if large, then it will be necessary to secure them by ligatures, in order to prevent present or future hæmorrhage, which, if it should occur, would effectually prevent the adhesive process. The sides of the wound are to be brought into contact with adhesive plaster, covering it with lint and a bandage.

Another disease which the breast is the subject of, and it is said even more frequent than scirrhus, is the pulpy tumour know by the name of FUNGUS HÆMATODES. In dissecting this tumour after removal, it is discovered that there is more disease in its substance than in scirrhus. The first appearance that it presents is a small cluster, swelling like a sponge distended with a quantity of fluid, yielding on pressure, but returning again to its former size. When this is removed, it possesses great vascularity, so that the vessels cannot be entirely emptied on pressure, although the tumour may be a little diminished. It is almost altogether unattended with any pain, is extremely moveable, much more so than that of scirrhus, and perfectly detached from the surrounding parts. It has not that marbly hardness scirrhus has, and this, with the want of pain, distinguishes it from the latter.

This tumour grows from that tendinous substance which connects the parts of the breast together, and not unfrequently from the fascial covering of the pectoral muscle. This, like scirrhus, has an imperfect suppuration going on, but the progress of it is different; first, in its being larger, and forming a cyst which contains a large quantity of fluid; this, when discharged, has the appearance of whey mixed with pure matter. In this respect it is something similar to the hydatid breast, but it does not in this disease admit of any relief from injection. It is more rapid in its progress than true cancer, spreading, from absorption, to the glands in the axilla, which are generally considerably larger than in cancer.

How far the operation may be proper, when this enlargement of gland has taken place, is yet to be determined; but I think the operation in these cases would be quite useless. It is necessary in the removal of the breast in this disease to prevent a recurrence of it, to take particular care that the whole of the breast is removed, and even parts at some distance from it: the aponeurosis of the pectoral muscle is to be also taken away. The great debility and prostration of strength caused by this disease is to be attributed to the quantity of fluid constantly discharged, and hence often by removing the disease the patient recovers, although in an exhausted state, which will require time and great care to surmount. From the vessels being much larger in fungus hæmatodes than in true scirrhus, it necessarily follows that the hæmorrhage is greater, and more vessels require to be secured after operating.

There are several other diseases to which the breasts are liable, but one that I shall particularly dwell on, as it has often been erroneously mistaken for cancer, and is an affection generally curable. It is what I would term an IRRITABLE TUMOUR. It often occurs in florid young women of sanguine temperaments, most frequently before marriage, and in those who have not had any children from the age of seventeen to twenty-one, when the passions are strong, and call for desires that are not satisfied.

The discriminating marks between this disease and scirrhus are two-fold; first, its exact limits cannot be observed, i. e. where the tumour ends and the glandular substance begins, as can be known in scirrhus; and, secondly, an extreme tenderness to the touch, even from the slightest pressure, and this not only for the moment, but is prolonged for hours afterwards; yet there are no marks of external inflammation, no redness of the skin, &c. This disease is capable of being remedied, but from the want of knowledge of the case, it is often unnecessarily the subject of removal. As this affection originates at, or soon after puberty, the remedy I should recommend, and one which has been known several times to be attended with complete success, is Dr. Griffith's mixture. A stimulating plaster should be made use of, such as the empl. lytharg. comp., the empl. ammon. comp., or even the empl. saponis. The breast is to be kept warm by means of flannel, fur, or by a bladder of warm water occasionally renewed. Change of temperature aggravates the disease.

It is from the cure of this complaint that certain practitioners, some professed quacks as well as others, have arrogated to themselves the skill and credit of having cured cancerous affections; but practitioners of credit and respectability ought not to be cajoled by such puffers; as there is actually no remedy yet found out capable of eradicating the latter disease. In opening the breast after removal of an irritable tumour, the common appearance it presents is a little thickening of the glandular substance, owing to the arrangement and nature of the coagulable lymph effused.

LECTURE XXII.

ON AMPUTATION.

Previous to performing this operation, a tourniquet is to be properly applied, so as to make sufficient pressure on the principal artery: if the lower extremity be to be removed it should be secured *one-third* the thigh downwards, as the artery passes here close to the bone, and can be readily compressed; if the upper extremity, it should be put on two-fifths *downwards* on the upper edge of the biceps muscle.

Fingers or toes.—The same method is applicable to either. If the *second* or *third* joint of the former requires to be amputated, let an assistant, with a piece of tape, separate the fingers, so as to leave enough of room; then make a circular incision beyond the joint, and a cut on each side as far as the joint, for the purpose of forming two flaps, which are to be raised; then turning the finger on one side, divide the tendons and lateral ligaments on the inner and lateral parts, and pass the knife into the joint and separate it; the flaps are then to be brought together and retained with adhesive plaster.

The *first* joint is rather more difficult, and this consists in the situation; for it should be recollected it is from the knuckle about the one-eighth part of an inch. There are two lateral or angular incisions to be made, and supposing it is the fore-finger, the first is to be on the outside and carried to the back of the joint, the other in a similar direction cutting between the fingers, so that both incisions may meet, forming a kind of triangle; the extensor and two flexor tendons are next to be divided down to the joint, then depress the finger, cut the ligament open and separate the finger; the parts are to be brought together with adhesive plaster.

Observe.—It is seldom requisite to secure any artery; but should the bleeding be profuse, a ligature may be applied.

TARSAL BONES.—It is often required either from a mortification of the toes, caused by being frost bitten, or disease, to remove these parts. I should think it far preferable to amputate the tarsal bones, to taking off the limb below the knee, for several reasons: the patient not only suffers less constitutional irritation, but has a greater advantage in the use of his leg. A circular incision is to be made about the middle of the foot, and two lateral ones, forming two flaps, exactly similar; these are to be raised, and turned back. It is requisite that the tendons and muscles should be divided quite down to the bones, especially at the bottom of the foot, which are large, and seated very deep: the bones are then to be sawed through. There are three arteries to be secured by ligatures—the anterior tibial, and two plantar arteries: the edges of the wound are to be brought together with adhesive strapping.

BELOW THE KNEE.—Amputation may be done by means of a flap, or what is undoubtedly preferable, the circular operation, as there are many objections to the former mode, which is now generally abandoned by the profession: the constitutional irritation is more considerable, and if any subsequent hæmorrhage should take place, the difficulty of finding the artery will be great; besides, taking down the flap after adhesion has once commenced, will be attended with evident inconvenience, and it will be almost impossible a second time to procure union by the adhesive process. Another disadvantage attending it is, if any portion of bone exfoliates, which often is the case in robust people after accidents, there is great difficulty in the removal of it. The one advantage, however, experienced from its adoption, is that a cork leg will fit with more ease and comfort, consequently it is generally preferred by people of fortune. In the majority of instances this cannot be effected, as the greater bulk of patients are not able, on pecuniary accounts, to be thus accommodated with artificial legs: I, therefore, would never advise this mode of operating, excepting in cases, where from disease, or other causes, little integument would be saved otherwise. It may be done thus: having secured the artery with the tourniquet, push a catlin under, and through the muscles, posteriorly to the fibula, bringing it out at the opposite side; then measure the quantity of integument necessary to cover the stump, and cut downwards close to the bone, by a longitudinal incision, as far as is requisite for the purpose: let this be intersected by a semicircular incision. A semilunar incision must then be made on the opposite side, which must depend upon the want of integument, as to the extent it should be raised. The interosseal ligament is now to be divided with the catlin, and then the bones are to be sawed through with the convexity downwards. There are three arteries to be taken up: the anterior and posterior tibial, and the peroneal. The integuments are then to be brought together with adhesive plaster.

The *circular* operation is to be thus done: ascertain the quantity of integuments necessary, which will depend upon this circumstance—if the limb be wasted from disease, two inches will be enough; but if after an accident amputation be necessary, never less than three or four inches. Make a circular incision six inches below the knee joint, so as to cut through the integuments and fascia at the first stroke of the knife, taking care not to touch the muscles; then dissect the integuments back from two or four inches, and retain them in that posture while the muscles are cut through by a similar circular incision, close to the retracted skin; then with a catlin divide the interosseal ligament, and saw the bones through about four inches below the patella: while this is doing, an assistant must hold the limb in a straight line with the thigh, otherwise the bones will be liable to be splintered. The same arteries require securing, and the same after treatment as in the flap operation. *Observe.*—In these operations it will be best to saw both bones through at the same time.

Above the Knee.—Compressing the artery properly, and the limb being supported by an assistant, a circular incision should be made immediately above the knee joint, or as near to it as possible, so as not to cut into the latter: if the disease requiring the operation be scrophula, the incision must be made higher up, as the collection of matter pushes the tendon of the rectus muscle higher up. Generally from two to three inches above the patella is the proper place to commence making a complete division of the integuments and fascia, which adheres to the tendons of the rectus and triceps: the integuments can then easily be retracted or drawn back three inches in length, which is enough to be saved. The muscles, &c. are then to be cut through by another circular incision down to the bone, which is to be sawed through. The only artery of consequence is the femoral; some small branches will occasionally be required to be secured besides. A roller must be applied for the purpose of keeping down the muscles, and preventing their retraction, otherwise the bone will be apt to project. The integuments are to be united by strapping. It is usual both here and below the knee to cover the adhesive plaster with a pledget of soft tow or lint, to be retained by linen, or a laced stocking.—It is also customary to give an opiate when the patient has been put to bed. The tourniquet must be left loose about the limb.

Remarks, at the hip joint.—It would be extreme madness, it is thought, to attempt this operation: I am not aware it has been performed but a very few times, and these patients did not survive more than twenty-four hours afterwards. It can only be warrantable in one particular case; when a shot has shattered the head of the bone, and the patient is of a thin and spare habit: but in diseased state of the parts, as in scrophula, for instance, it would be of no utility, as the acetabulum is also affected, and cannot be come at, as in amputation at the shoulder joint, where the cavity of the os humeri can be exposed.

Below the hip joint.—If attempted here, the femoral artery must of course be taken up; there can be no doubt as to sufficient nourishment being afforded to the stump. An incision must be made, so as to find the artery just as it emerges from under Poupart's ligament, pass a broad ligature under it, and tie it *loosely*, so as to secure it for the moment; let an assistant hold the ligature: then make two semi-circular incisions, so as to form two flaps, one above, the other below; raise them sufficient to allow the bone to be sawed through. The profunda circumflexa and ischiatic arteries are to be secured, the ligature then is to be removed from the femoral, and another ligature on Dr. Jones's plan is to be substituted. The integuments are to be brought together in a similar manner to what I have previously described.

At the hip joint.—The operation here is nearly the same as below it—the femoral artery must be in the first instance secured; the other arteries had better be taken up as the operator proceeds in forming the two flaps, which are to be carried further up, and instead of sawing through the bone, cut through the capsular ligament and ligamentum teres, and remove the bone from the socket.

At the wrist joint.—It is a great object, when it can possibly be done, to amputate at the wrist joint, as the operation is very simple, and the symptoms of irritation much less than when it is done below the elbow. First, feel for the styloid process of the radius, and one inch below carry a circular incision around the wrist, then dissect the integuments back to the styloid process, at which part, by turning the hand to the opposite side, the opening should be made into the joint, and the operation is easily effected. It is particularly necessary, in this case, to save sufficient integuments to cover the joint, as no union by granulation will take place if the cartilage be exposed, unless it is previously absorbed, which would be a long and tedious process, and the certainty of ultimate success would be uncertain. Three arteries are to be secured, the radial, the ulnar, and interosseal, now become the external interosseal.

THE FORE-ARM.—The operation here should be avoided as much as possible; I would much rather always amputate above the elbow, for the stump of the fore-arm is useless, and it is besides much more dangerous to do it, on account of the great number of tendons which must necessarily be divided, and which will suppurate and slough through the whole extent of the arm. This almost always happens, and instances have been seen of death occurring from it; if the fore-arm be to be removed, it is desirable to do it as near the elbow as possible, because here the cut is made through more muscular parts. It is very similar to the operation below the knee—a circular incision through the integuments, which are to be drawn up sufficient to cover the stump, another cut through the muscles, then use the catlin to sever those parts between the bones, and in sawing turn the hand upwards, stand on the outer side, and saw both bones through at once: four arteries require ligatures, the radial, ulnar, and two interosseal.

The operation at the *arm* is exactly similar to the thigh, the structure of the parts being much alike. If very high up, the artery cannot be compressed with the pad of the tourniquet; it then must be firmly pressed on as it passes over the first rib by an assistant—the principal artery is the brachial, but small branches will now and then require ligatures. Some knowing ones made a whole sheet of this operation; after a circular incision is made, the biceps is to be divided, then the muscles in front of the arm bending the elbow, then straightening it, the triceps may be cut through, next the brachialis internus, &c.; all this is very amusing, no doubt, but I have too much respect for the junior members of the profession, to desire they will retain more of this detail than they can rationally digest, which puzzled me at first to know what it meant.

SHOULDER JOINT.—This operation, it is found, may be done with great safety, even when there is considerable enlargement of the limb, as from exostosis, &c. It may be performed in two ways: First cut down and secure the axillary artery, which will be found concealed by the nerves of the brachial plexus, some of which it will be found impossible to avoid dividing without very great care is taken, then make a flap of the deltoid muscle, cutting it upwards until the head of the os humeri is exposed, forming the angles of the flap above, so as to make it of a semi-circular form, and if the circumflex arteries bleed freely, they must be immediately secured; then carry the incision round the under part of the limb until the bone is hereagain exposed, incline the bone upwards and backwards, and a cut can easily be made into the joint at the under part, and dividing the capsular ligament, the head of the bone is easily dislocated from the glenoid cavity of the scapula, then bringing down the flap which forms a cushion over the joint, it is to be retained in that situation by adhesive strapping.

One objection to this mode of operating, is that the flap does not unite to the glenoid cavity; this latter being a secreting surface, and covered with cartilage, the secretion accumulates, and sinuses are formed from ensuing inflammation; to counteract this objection, the cartilage of the glenoid cavity must be scraped off; thus the secretion will be prevented, and granulations will arise, which will unite with the flap.

SECOND MODE.—If there be any enlargement of the os humeri or other cause, that a flap cannot be made of the deltoid muscle, a double flap may thus be formed—secure the artery as before, then make an incision obliquely at the anterior and upper part of the arm, carrying it down to the axilla, so as to form a flap, then make another incision on the opposite side, exactly similar, commencing at the upper point of the first incision, and meeting it below; the head of the os humeri being exposed, turn the arm backwards, and by cutting through the capsular ligament, the joint is easily separated; the cartilage must be cut off from the glenoid cavity, the arteries must be secured by ligatures, as in the other operation, then bring the flaps together. This, I conceive, makes a much neater stump, and one which will possess more living powers than the single flap, and I have understood two surgeons of eminence intend adopting this plan; besides the circumflex, the superior scapular artery, which is large, will require a ligature, and also various communicating branches.

I think in both these operations it will be better not to secure the axillary artery in the first instance by ligature, pressure properly made on the artery as it crosses the first rib will be sufficient to restrain hæmorrhage till the operation is complete, when it may be secured with the others.

Remarks.—When ligatures remain a great while, they should be drawn tight every day, by means of a small piece of wood or bougie twisted round their ends.—I have again to observe, that the first dressing after amputation should not be removed under a week. In gun-shot wounds, where the head of the os humeri is shattered, Baron Larrey, and other military surgeons, have succeeded in removing the splintered portions of bone, and rendering amputation at the shoulder joint unnecessary; the arm must be afterwards supported in a sling, so as to keep the end of the humerus as far upward as can be done.

LECTURE XXIII.

ON HERNIA.

Hernia is a disease of a most important nature, on account of its frequency, and of the very great and imminent danger to which the person afflicted with it is liable: it has been improperly termed a rupture. Hernia means the protrusion of some viscus from its proper cavity, by which a tumour is formed, sometimes internally only, but mostly externally:—according to the acceptation of the term, it might with propriety be applied to any swelling produced by the dislodgment of parts from the boundaries within which in a state of health they are contained: those only are applicable to surgical treatment in which the tumour is perceptible.—It is a disease to which every human being is subject at every period of life, and from a great variety of causes.

The situations of these tumours are as various as their contents. There are as many as twelve different species, which have obtained their names from their situation; as the *bubonocele* or *inguinal,* when the sac and its contents extend only to the groin: *oscheocele* or *scrotal,* when in the scrotum: *crural* or *femoral,* when below Poupart's ligament in the thigh (this is most frequent in women): the *exomphalos* or *umbilical,* at the navel: the *ventral,* when the protrusion has taken place at the linea alba or linea semilunaris: the *pudendal,* when descending between the vagina and the ramus of the ischium, forming an oblong tumour in the labium: the *vaginal,* when it protrudes in the space between the uterus and rectum. The *perineal* between the bladder and rectum in men, between the vagina and rectum in women. The *thyroideal,* or *hernia foraminis ovalis,* when it protrudes through the obturator ligament, descending between the obturator muscles. The *cystocele,* when the urinary bladder is included. The *ischiatic,* (which is very rare) when at the ischiatic notch. The *phrenic,* when protruding through the diaphragm: and the *mesenteric* and *mesocolic,* when through the mesentery, or mesocolon.

If the contents of the hernial sac are only intestine, it is called enterocele, or intestinal hernia: if omentum only, epiplocele, or omental; and if both, entero-epiplocele, or compound hernia: with respect to its other contents, the names are derived from the contained viscus; if the stomach, gastrocele; if the liver, hepatocele; if the urinary bladder, cystocele, &c. The contents may be distinguished from each other by a careful examination: if omentum only, there is an irregularity in the feel, and the tumour is commonly of an oblong shape; if intestine, it forms a more smooth, round, and elastic substance, and appears as if distended with air, which it is. When both omentum and intestine are included, the same rounded form presents itself, as if intestine only; but by examining more minutely the irregularity of the omentum is perceived. Thus, so far, the contents may be known; the other parts occasionally occurring in hernia are not so easily to be discriminated; if a portion of the urinary bladder, the feel is denser, and by the account of the patient an opinion may be formed. In the morning when he rises he finds the tumour very large, which is the contrary to the others; and at night it will be scarcely perceptible. This is easily accounted for. The patient has a considerable quantity of urine collected in his bladder in the morning, hence the distention, while previous to his going to rest the urine is evacuated; and thus, the cause of the diminution is obvious.

OF INGUINAL HERNIA.

This species of hernia has been divided into *four* different kinds; the most frequent of which is the *oblique*, which takes the course of the spermatic chord. The second, by no means unfrequent, though less so than the oblique, is that which passes directly through the abdominal ring, and hence called the *direct* hernia. The third is the hernia congenita, where the intestine, or omentum, is in contact with the testis *within* the tunica vaginalis. The fourth and last, is that in which *a cyst* is formed within the tunic itself, when the contents are either intestine or omentum.

By considering each, individually, more correct ideas will be entertained on this subject; and it is of importance to the student to preface it with an anatomical description of the structure of these parts, without which it is impossible to understand the ensuing details, and I may observe, it is to Mr. Astley Cooper the profession at large is indebted for the very able and accurate exposition of the anatomy of hernia.

When the integuments are removed, the lower part of the abdomen is covered on the fore part by a tendinous expansion, and on the side by muscular fibres, which are derived from five pair of muscles: as this expansion ascends it becomes narrower: in it, at the lower part, are two holes, or openings, called the abdominal rings, formed in the male for the transmission of the spermatic chords, and the round ligaments in the female. These rings, or openings, are made up of two columns of tendon, the upper column passing into the symphisis—the lower, into the tuberosity of the pubis; and these columns are joined by transverse fibres, and are of an elliptical, or, as some think, triangular shape. These I shall call the *external* abdominal rings.

Midway between the pubis and ensiform cartilage is a hole, or opening, called the umbilicus, or navel, formed for the passage of the umbilical chord, which is composed of two arteries and one vein. The arteries and vein are never found to perforate the peritoneum, as has been supposed, as it is as compact as in any other situation: the arteries pass upwards from the bladder, while the vein passes between the tendinous expansion and the peritoneum to the liver. The white line which is seen extending from the pubis to the ensiform cartilage is the linea alba: on each side is the linea semilunaris, which begins at the cartilage of the seventh rib, and is continued on each side just above the body of the pubis. The lines extending in a transverse direction are called the linea transversalis. The external abdominal ring appears merely to be formed by the splitting of the fibres of the external oblique. Mr. Pott considered that the chord took its course behind the ring directly into the abdomen. Albinus has shown in his plates that the chord took an oblique course.

The abdominal ring is shut up, and well protected by the tendons of the external oblique and transversalis muscles—and behind them, by that of the rectus: and to effect this still the more effectually, there is a fascia which passes up behind these tendons; from the deficiency of which, no person could stand upright without the hazard of the protrusion of some of the abdominal contents through the interstices, and this forms the only partition between the peritoneum and the external abdominal ring. I shall now describe its origin.

Poupart's ligament, or crural arch, is a doubling of the external oblique, and is extending or stretched from the spine of the ilium to the tuberosity of the pubis: this ligament splits into three distinct portions or fascia; two pass upwards and one downwards—the portions it sends upwards would be supposed at first to be peritoneum. The *first* is the *fascia transversalis—one small portion* of which passes downwards under Poupart's ligament to form the *anterior part of the sheath* of the femoral vessels; the *other part* passes *behind* the transversalis muscle, and forms a lining to it all the way up: now in this fascia is an aperture or opening, situated midway between the spine of the ilium and crus of the pubis, which is easily discovered by the little resistance opposed to the fingers, and this aperture is the *internal* abdominal ring through which the spermatic chord is observed to emerge from the abdomen, passing in an oblique course, in a kind of canal, under the edge of the internal oblique and transversalis, and the obliquity is downwards and forwards, from one inch and a half to two inches previous to its arrival at the external opening.

The *second* fascia, is the *fascia iliaca,* which passes over the muscles of that name: this shuts up the space underneath Poupart's ligament, while the fascia transversalis prevents the viscera from getting underneath the transversalis muscle. The portion it sends *downwards* is the fascia lata of the thigh, the inner part of which comes from the pubis: a part of this fascia is derived from the gluteus maximus muscle; there is a passage for the femoral vessels under Poupart's ligament or crural arch, the interstices of which are filled up with fatty substance, and lymphatic glands: this, and the external abdominal ring, are the only two natural openings through which the femoral and inguinal hernia protrudes: this will be more accurately described when I shall treat of femoral hernia. The *lower portion* of the *obliquus ascendens internus* passes through the abdominal ring with the spermatic vessels, and then forms the *cremaster muscle.*

In the description of hernia, it is requisite to understand perfectly the nature of the hernial sac. In hernia there is a smooth polished membrane in which the protruded parts are contained; this is denominated the sac, and is nothing more than an elongation of the peritoneum. In some parts of the cavity of the abdomen this membrane is more loosely attached than in others, and this is perceived to be the case at the lower part of the abdomen. It was, a few years ago, thought impossible for the peritoneum to admit of such a degree of distention as to surround tumours containing such large portions of the viscera as are sometimes pushed out; but it is now found that the peritoneum has the power of extension to a very great extent, and will accommodate itself to the degree of elongation necessary: the hernial tumour has been seen so extremely extended as to reach the knees of the patient, and in this sac of peritoneum were contained almost all the viscera of the abdomen. I knew two gentlemen, the one an archdeacon, the other a publican, who had enormous hernial protrusions, although not to the extent I have heard mentioned by gentlemen, and particularly by Mr. Cline, sen. All the living parts are found capable of increasing in size, according to the emergency of the case required—and this is the case with the peritoneum. When the sac *first protrudes,* it is *loosely attached,* and is capable of being *returned;* but when hernia has existed for some time, and is become more extended, the external surface is found to *adhere* to the contiguous parts, so that to return the sac with the contents, is a thing wholly impracticable, unless in a very incipient state, as the adhesions are such as not to admit of its being done. In consequence of this sac, or elongation of the peritoneum being protruded through the abdominal ring, it is liable to undergo some changes—it is found to be more *dense,* and *unyielding* in its structure; sometimes it is found *narrower* at one part than at another, and this is mostly found at the part where it is protruded from the abdomen; this is denominated the orifice, or mouth of the sac—other parts of the sac are liable to become contracted, and possess considerable density: these contractions are occasionally found to arise from the pressure of trusses on the pubes, which compresses the part so forcibly as to cause it to become thickened and contracted: there may form three or four of these, and frequently when the operation for hernia is performed, it is necessary to dilate them one after the other: another circumstance that is frequently found in an hernial sac, is transverse membranous bands, which are a considerable impediment to the reduction; these bands are extending from one side of the sac to the other; they are formed from the existence of inflammation for some time, by which coagulable lymph is continued to be effused till the sides of the sac are united, and by extension might be elongated, and form these bands. There is a possibility of there existing more than one hernial sac at a time: Mr. Cline, sen. accidentally found an instance, some years ago, of this kind. He found the two sacs formed on the same side, so that more than one protrusion might have happened, constituting a kind of double hernia—it is a very rare instance, and seldom occurring.

In the formation of hernia, they are mostly coming on in a very gradual and insensible manner: but occasionally they are found to be produced suddenly. Hernia are very properly divided into three different and distinct states: the *reducible,* or when the contents are easily replaced in the abdomen, suffering no constriction; *irreducible,* when the contents cannot be returned, from their size, and the smallness of the aperture, yet suffer no impediment in their functions, the intestinal canal not being interrupted; and *strangulated,* or incarcerated, where there is constriction, and cannot be replaced.

OF OBLIQUE INGUINAL HERNIA.

This species commences midway between the spine of the ilium and symphysis pubis. The first appearance of the tumour is over the iliac artery, where it will be found pulsating. A small portion of the peritoneum *first* protrudes *over* the spermatic chord, forming the sac; on the *inside* is the epigastric artery. As it descends it is confined by the oblique muscle, so that it turns downwards and outwards. After passing about two inches, it emerges through the abdominal ring. In its course above the ring, it has the tendon of the obliquus externus before it, the spermatic chord behind, and posterior to this again, the tendons of the internal oblique and transversalis. When it gets through the abdominal ring into the scrotum, it ridiculously has the name of scrotal hernia. The protruded parts have three coverings: the first is the aponeurosis of the external oblique muscle; next to this, is the cremaster, which is very dense if the hernia has been long down; and then the hernial sac itself appears, which is the thinnest of the three.

A knowledge of the existence of these coats, is of the very first importance; for, without it, a practitioner may, with great caution, in dissecting fibre by fibre, chance to do no injury, yet he spends a great deal of unnecessary time in the operation. In the scrotum, the sac is situated anterior to the chord, which is behind—below are the testes—on the *inner*, or *pubic side* of the mouth of the sac, is placed the epigastric artery.

DIAGNOSIS.—Hernia is known from other tumours near the ring, by its dilating by coughing; by its descending in the erect, and returning in the horizontal posture: besides, if intestine be present, it returns with a guggling noise. Hernia most frequently appears on the right side, at least in the proportion of sixty or seventy cases out of an hundred, according to Mr. Astley Cooper. Hernia sometimes advances, as I have previously remarked, to an enormous size, even to reach as far as the knee: here the parts are so thin, that the motions of the intestines can be perceived: this, I may observe, is most common in umbilical hernia. Inguinal hernia is sometimes liable to be confounded with hydrocele, for in this latter disease, it now and then happens, that the water reaches as high up as to form a double tumour, that above of a rounded, that below of a pyramidal shape. The tumour, as in hernia, dilates by coughing. Do not decide too hastily; examine it with attention, and a transparency will be discovered. Varicocele, or an enlargement of the spermatic veins, is still more likely to be mistaken; as this dilates, by coughing, from the return of the blood: also if the patient is directed to lie down, the tumour will disappear like hernia, but returns in an erect posture. To distinguish it, let the patient be placed in an horizontal position, then by lifting up the testes, empty the veins into the abdomen; after this is done, place your finger on the abdominal ring, direct the patient to rise, and if it be hernia, no descent will take place; but if varicocele, the scrotum will soon be filled as before. Inguinal hernia is also apt to be confounded with an hydrocele of the spermatic chord. This disease, when it takes place between the ring and abdomen, protrudes, and can be nearly pushed into the abdominal cavity; but although a small tumour should still remain, no man would operate for hydrocele, except it was transparent. There are, besides what I have enumerated, cases of a complicated nature, as hernia combined with hydrocele: the chord is now and then split into two portions upon the hernia, the vas deferens being on one side, and the spermatic artery and vein on the other. On this account it will be right, in operating, to be cautious in avoiding any vessels, by cutting at all on one side, as the slightest deviation from the centre of the tumour might prove fatal.

CAUSES.—Any disease which occasions an enlargement of the viscera, so as to increase their pressure on the parietes. Obesity and pregnancy may also be ranked as causes, but a more frequent one is that which affects the abdominal parietes in old age. Any cause acting too powerfully on the abdominal muscles will induce pressure on the viscera on those parts which may be naturally weaker than the rest, as at the navel, abdominal ring, &c. and force a protrusion—such as jumping, riding, lifting heavy weights, blows, kicks, &c. especially after a severe illness. Those who have had strictures are liable to hernia.—Want of strength, and deficiency in the abdominal parietes; warmth of climate, by relaxing the body, and much exercise, may be reckoned causes. Many think, but it is not generally credited, that those who live on oleaginous substances are more subject to hernia. It is more frequent in France than in this country, which may be attributed to the nature of the climate. Though it has been asserted that one in nine have hernia, yet it is thought one in fifteen is more likely to be nearer the point. In old people hernia is generally discovered, and if an allowance is made for women and children, the proportion will be as above stated.

Treatment of reducible Hernia.

It is absolutely necessary for a person, the moment he discovers a hernia, to have a truss applied; even though the tumour may be but small, and occasion no great inconvenience, and easily returnable, for the danger is proportionably greater. To measure a person so as to have him accurately fitted, all that is required is to carry a string round the pelvis, just above the abdominal ring. Trusses are made of an elastic substance, generally of steel, so constructed as to keep up constant pressure, sufficient to resist the action of the muscles, and so formed as to allow of the patient's going about his business as usual. In applying a truss be careful to let the pad rest midway between the spine of the ilium and crus of the pubis over the iliac artery, so as to reach as far as the abdominal ring, and not directly upon it, as is usually done. The truss-maker should be instructed to make the neck of the truss short. In case the hernia is very large, the pad is to be placed at right angles, so as to have a perpendicular bearing from the ring upwards. The reason of this is, that owing to the size of the hernia both rings, that is, the internal aperture and external, are brought nearly into a straight line. There is one very material objection to Salmon's patent truss, which is, that the patient cannot wear it at night, which is absolutely necessary to attain a cure. To effect a cure, a truss must be worn several years: from pressure an obliteration of the mouth of the sac happens, and hydrocele sometimes occurs afterwards, which may be treated in the usual manner. A well constructed truss, properly applied, so as to keep up an uniform pressure for a long continuance, will cause the internal part of the sac to be thrown into folds, in consequence of the contraction of the cremaster muscle, which is occasioned by the pressure, so that ultimately a thickening of the membrane is produced, which occasionally is found to be completely united, so as to effect a permanent cure.

LECTURE XXIV.

IRREDUCIBLE HERNIA.

Of this species there are two kinds, one in which there is no inflammation, the other attended with strangulation. It may originate from four causes:—First, from an enlargement of the omentum, and a thickening of it by growth and pressure, and from its being considerably loaded with adeps, for now and then the omentum is of that size that it is impossible to return it. Secondly, from an adhesion of the intestine, or omentum, within the sac. Thirdly, in consequence of membranous bands formed from inflammation across the hernial sac: and lastly, from the omentum enveloping the intestine in such a manner as to prevent its return; under these circumstances the former, not the latter, adheres.

An irreducible hernia is very frequently caused by the neglect of the patient to pay due attention to himself;—he allows the hernia to be down, perhaps, all day, and likewise at night, and frequently they neglect the truss entirely, hence the sac gradually enlarges by the weight of the tumour, more of the abdominal viscera continue to be protruded, and at last it becomes so very large as to be totally impossible to replace the contents. It will be soon found, from the patient's account, whether ever he has been able to reduce it or not.

After hernia has continued irreducible for some time it gets to an amazing size; it is also at times accompanied with hydrocele. A bursting of the intestine in these cases from a blow or a fall, was witnessed in a man in Guy's Hospital some time ago, and a person is not only exposed to this danger, but also to that equally serious—strangulation. An omental hernia, when it has long been irreducible, now and then gets scirrhous and carcinomatous, and proves destructive to life by going into a state of ulceration.

Treatment.

When called to a patient, provided the hernia is not strangulated, and has not long been irreducible, it may after some few efforts be returned, although at the first attempt it does not appear easy to be accomplished. Ice applied in a bladder to the scrotum has had the effect of diminishing the tumour in the course of twenty-four hours, and in the space of two days more it has been perfectly returned. So that Mr. Astley Cooper was led to advance an opinion in his valuable work on this subject, that though hernia is irreducible by the taxis, yet it may be sometimes accomplished by the application of cold, if there should be no existing inflammation. It is recommended by authors to put the patient on a poor spare diet, in order to produce an absorption of the omental adeps: but the difficulty here is to get patients to submit to it long enough—also giving purgative medicines, &c. to facilitate this object. If success should not attend the long continued application of cold, apply a laced truss on the scrotum, as this will by its pressure excite absorption; and should this point not be gained, still it will, as long as it is worn, prevent further growth: but supposing the contents of the sac to be omentum, the patient's feelings must be consulted in the application of the truss, as to the degree of pressure that can be borne. The truss should be a spring one, and made light, and a few hours after it is applied it should be examined. A reducible hernia may by inattention be rendered irreducible, or from the formation of adhesions.

STRANGULATION.

If part of the intestinal canal form the tumour, and become obstructed by a stricture upon the prolapsed parts, or a stoppage of the circulation, when a portion of omentum alone forms the swelling, the patient may be considered in very imminent danger; but it is not so great, nor attended by so alarming and speedy a termination if omentum only is included, as that organ is not so immediately necessary to life as the other parts are.

The symptoms of a strangulated hernia, are pains in the diaphragm, causing a sensation as if a tight cord were put around the chest at that part: a constant rejection of wind from the stomach—and the patient, under this circumstance, is anxious to pass it downwards; but finds it impossible. When, however, it does take place, it is an event to be particularly attended to, denoting that strangulation is past; and the first favourable symptom, after an operation, is a cessation of it; incessant vomiting, with constipation. This latter, however, depends upon whether it is omental or intestinal hernia; for if the latter, though it be small, there will be no stools; but in the former case, evacuations not unfrequently take place. Also this further remark will be right with respect to constipation. In case the hernia has gone on to mortification, an immediate discharge per rectum takes place, which, instead of being favourable, is quite the contrary. The pulse, at first quick and hard, after some time becomes quick and small, having a thready feel similar to that in enteritis. As soon as mortification has commenced, it becomes intermittent and irregular, and the general opinion is, that the artery is broader in its diameter; but the increased diameter, if so, is no certain sign of mortification having taken place. Hiccup is by no means, as was formerly supposed, a sign of mortification, and no surgeon, at this present day, would conceive, that this symptom alone, is a barrier to the operation. I have reduced a strangulated scrotal hernia, where hiccup had existed for a considerable time, in the case of Howel Jenkins, and he recovered as soon as could be expected, without any difficulty.

As to the changes which the tumour undergoes, it is, at first, very tense, as if inflated; this, however, is not so conspicuous when the omentum is down. Next a redness is observable on the surface, and the finger leaves an impression, as in anasarcous swelling, in consequence of an effusion of serum. As soon as mortification has taken place, it is indicated by the inflammation on the skin taking on a *purplish hue*, and this is so generally the case, that I have heard Mr. Astley Cooper say, that he felt himself justified in stating, that spots will be found on the intestine; of which, he had seen an instance, in a woman who came under his care some little time previously. Sometimes an emphysematous feel attends this inflammation; and this is occasionally occurring, in consequence of the intestine yielding. If the mortification is suffered to take its course, sloughing of the scrotum and intestine is the result, by which the fæces are evacuated at the wound. It is seldom patients are strong enough to get through this process, nineteen in twenty dying before: nature however sometimes succeeds, but the instances are very few.

Vomiting continues from time to time, and at last becomes so frequent, as to cause an inversion of the peristaltic motion of the intestines, and it is said that the fæces are ejected; but this is impossible to take place, as the valve, situated between the small and large intestines, prevents it. What is vomited is generally of a greenish cast, produced by the quantity of bile thrown up with it. When the symptoms of strangulation have existed for some time, the tumour is more tender to the touch, and the abdomen becomes tense and painful. I should rather consider hiccup as a symptom *preceding the approach* of mortification, than of its actual existence. The pulse at length intermits;—the patient is all along exceedingly restless, and appears extremely anxious and distressed: and from the constant varying of his position, to endeavour to procure relief, becomes very much exhausted. The pulse continues intermittent, and the tumour is less painful, which is generally a certain sign of the actual existence of mortification, and the sickness also is less frequent: here a surgeon may be misled: the sudden abatement of the vomiting;—pulse soft;—skin cool,—with scarcely any pain upon examining the tumour,—and the patient's stating his being a great deal better and comparatively easy, are very deceptive, and might be erroneously attributed to a total cessation of the strangulation, by those who have had but little experience: a patient has been known, under such circumstances, to be declared out of danger, and in five hours he died: however, in general, their death is not so rapid; but in twenty-four hours they inevitably expire. If inquiry is made into the state of the case, the danger will be soon apparent; but if the abdomen, as well as the tumour, is soft and not painful, with no vomiting, &c. it may fairly be concluded there is an abatement of the symptoms of strangulation, and the patient out of danger.

On dissection of those who have died of strangulated hernia, if omentum is down, it will be found, as soon as the sac is opened, a little discoloured; but not so much so as would naturally be expected from the pressure of the stricture: it takes on the character which the intestine has when strangulated, and has a crispy feel. If intestine, it is found of a reddish purple colour, with spots of extravasated blood on its surface: it is also covered with a portion of coagulable lymph, which can be easily pulled off;—but, take care not to mistake this for the mortified part. On the inner side of the sac, is a similar appearance, through the adhesive process having here commenced. The quantity of water or fluid within the sac, depends a great deal upon its contents, whether intestinal or omental—being considerable in the former case, and vice versa in the latter: the looseness of the intestine, and length of the strangulation, have also much to do with it.

There are *three* different situations in which stricture may be found. The first I shall notice, is that at the abdominal ring: this is not so frequent, and is mostly found in old and large hernia: it is formed by the margins of this aperture. A more common seat of stricture, is about one inch and a half from the external opening, in the direction I have previously remarked, of the course of the canal upwards and outwards. The reason that it here occurs so frequently, is owing to the common practice of wearing trusses for a time, and then leaving them off, so that the orifice of the sac becomes contracted. The stricture is produced by the tendon of the tranversalis on the inner side, and the musculur part of it on the outer; by its fibres running across the neck of the hernial sac, so as to produce a gradual compression; and by the fascia transversalis, the semicircular border of which passes under the sac. A *third* seat is within the sac itself, occasioned by membranous bands, or chords entangling the intestine, aud great care is requisite, in operating, to divide them without injuring the bowel.

Treatment.

When called to a patient labouring under strangulation, the first, and primary object, is to replace the parts in their natural situation, as medicine will avoid nothing. To attain this end, what is to be attempted is the taxis, which means efforts properly applied to reduce and return the prolapsed parts with the hand. It is to be performed thus: place the patient in a recumbent posture, with his shoulder and knees considerably elevated, and the thighs bent to the trunk, so as to relax as much as possible the abdominal muscles and fascia of the thigh; then, supposing the tumour to be on the left side, embrace it with the right hand, while, with the finger and thumb of the left hand above the ring, move them gradually from side to side, kneading in a manner the tumour, and at the same time making steady pressure with the right hand: it is not to be expected that it will go up suddenly, but in a gradual manner: the direction of the surgeon's efforts must be in the course of the canal, that is, upwards and outwards: these efforts may be continued from a quarter to half an hour. It is observed by Mr Lawrence, in his treatise on this disease, that sometimes it is attended with success to draw the tumour downwards. In the taxis, much force should not be used, as the intestine may be burst, of which several instances are on record. Though there is no doubt success cannot follow, in the majority of cases, without the taxis repeatedly tried, yet it is not always equally proper to attempt it directly, without first having recourse to other means. I will suppose, for instance, a strong young man has a strangulated hernia of a sudden, in consequence of lifting a heavy weight, and on approaching his bedside he is found in much pain; here the taxis ought not to be had immediate recourse to; blood should be as expeditiously drawn as possible, and cold applications made use of: by these means an easy return will be accomplished. In cases where the patient complains of much pain, surgeons have been under the necessity of abandoning the taxis and bleeding freely, when they have been surprised at its having gone up without the least difficulty. It is to the temporary weakness and syncope, which the sudden loss of blood induces, that may be attributed the peculiarly favourable facility of reduction; but on the subject of bleeding, there are many of our best writers advocates for and against its adoption. In old people the taxis can be used, and continued with more freedom. In case manual efforts are not attended with the desired success, take away from twenty to twenty-two ounces of blood; this evacuation not only facilitates reduction, but lessens subsequent irritation, if the operation is required. If these means should be unsuccessful, make an infusion of tobacco, ʒj. to ℔j. of water, throw up one half, and increase this, if found insufficient, by using the remainder: it is attended with great risk to throw up the whole at once, as will be illustrated by the following case. A young girl, some years ago, was admitted into Guy's Hospital, and had the whole quantity thrown up at once; alarming symptoms came on, and Mr. Astley Cooper was sent for; but when he came, she had vomited a great deal, and the hernia was returned, but such excessive fainting followed, as to occasion a speedy dissolution. Less quantities have been known to produce this lamentable effect. What I allude to, is a decoction or infusion for about ten minutes; others employ the smoke, and very ingenious apparatus have been invented for this purpose: I think the first is by far preferable. Tobacco has a relaxing and depressing influence on the body universally, lowering the pulse, inducing nausea, sickness, cold sweats and syncope, and under slight pressure the hernia becomes reduced. I have heard Mr. Cooper say, it was a most unpardonable neglect in the practitioner, not to use tobacco in strangulated hernia, and which ought to be impressed on the mind of every surgeon.

Powdered ice, in a bladder, must be applied to the tumour; if this cannot be procured, the powdered muriate of ammonia and nitre, ℥j. to lbss. of water; this will produce a degree of cold equal to 20°: it must be frequently changed, as it soon acquires the temperature of the body by the abstraction of its heat: even rags, dipped in spirit and water, will suffice occasionally. Cold applications have this effect: they cause a corrugation of the whole scrotum and the cremaster muscle, which thus act on the bowel, or prolapsed contents, and by its pressure, the tumour becomes lessened, and ultimately reduced.

As to the warm bath, from what I can judge, I do not conceive it to be equally efficacious with the cold application and tobacco enema: I have seen it frequently used at Guy's Hospital, and when syncope is brought on, it will be serviceable. The advantage of cold applications over warm, is, that heat gives no relief if it do not assist in reducing the strangulation pretty quickly; whereas, if cold is used, if it do not gain the point desired, it will arrest the progress of inflammation. Fomentations should never be used, unless there is slow inflammation going on, and no direct symptoms of strangulation. Mr. Hey is an advocate for opiates, given in large doses, after bleeding, in some athletic persons, and purgatives he has found of great utility in those cases where the intestine has retired, and the omentum only remains strangulated; he also countenances the warm bath: in many instances where it has been used, reduction has been accomplished—but I leave these subjects, as I find them, without any comment. I have only to observe, in strangulated hernia the greatest danger is, useless delay, and reposing confidence in remedies or treatment to an unpardonable extension of time—a rapid disease must be combated by decisive practice. Apply the taxis; if young and plethoric, bleed; if the warm bath be ready, emerge the patient in it; if not, apply ice to the tumour, and a tobacco enema is to be injected. What Mr. Lawrence very properly says, is this, if the surgeon is not called in till some progress has been made, the tobacco enema is to be used, and the topical application of cold: if what Mr. Pott remarks be correct, that the operation, when performed in time, was only fatal once in fifty times, I have only to observe, how culpably negligent I have seen surgeons, as their success is by no means so flattering, and why? from its being protracted to too great a length; as Mr. Hey of Leeds states, when he first got in practice, from dilatory practice he lost three patients in five; afterwards he waited, when called in, only two hours, and tried bleeding and the tobacco enema, and in nine cases he lost only two; he says he has since performed the operation, when his work went to the press, thirty-five times, and he has often had occasion to *lament* that he performed *too late*, but never that it was done *too soon*. Hernia strangulated has been seen to prove fatal in the short space of twenty-four hours. Mr. Astley Cooper tells us there is scarcely any period of the symptoms which forbids the operation; but pain on pressing of the abdomen, and tension, he believes call for its immediate adoption. Mr. Lawrence says, when the rupture becomes painful, and a sufficient or moderate pressure cannot be endured, the operation is immediately necessary.

Operation.

As soon as the time is fixed for performing the operation, which will be determined entirely by the judgment of the practitioner and the existing state of things, such as extreme tenderness of the abdomen, indicating peritoneal inflammation, or other symptoms not so alarming, yet rapidly increasing: at all events as little time should be lost as prudence would dictate, for on the speedy, and I may remark early execution of it, will depend all future chance of success; in fact, I firmly believe, the generality of failures may, in a great measure, be ascribed to its being resorted to too late: at the same time I am of opinion, that prior to using such measures or means as I have previously mentioned, the operation should not be attempted, as there is a chance, that from the process of inflammation in the abdominal cavity, the patient dies: hence the old practice of a radical cure has been abandoned, for this reason, that though the inflammation was not present at first, yet it was induced in the operation: therefore let the patient be well reduced, as in this case the result will be more favourable. There is, however, one exception to this, viz. in old people, where the loss of much blood would be unnecessary, as in them there is a less disposition to inflammation than in the young and plethoric. A good deal of management is now and then requisite to get the patient's consent to the performance of the operation; it is better to tell him candidly, that every prudent and advisable attempt has been made to return the contents of the sac, but it has been rendered fruitless by a string confining it across, and that if he will only suffer this to be cut through, it will be very possible to succeed: it is extremely injudicious to cause any alarm in his mind. In old people success may at last attend repeated attempts by the taxis, but in young subjects these only aggravate materially the complaint; besides the danger in old people is proportionably less, and may be adduced as another cause for extended delay; but supposing the patient's consent is gained, and every thing ready, the operation is to be performed in the following manner: place the patient upon a table three feet high, with his legs hanging over and resting on a chair; the operator is to stand between the thighs; the parts are to be shaved, and the hair carefully wiped away, for if any should remain, and fall into the sac, great irritation would be produced. The surgeon, embracing the tumour in his left hand, is to make an incision from one inch to one inch and a half of the spinous process of the pubis, commencing from the upper part of the abdominal ring, and extending it through the integuments to the lower part of the tumour, the centre of the latter being the direction for the incision; by doing which the external pudic artery will be divided—it must be immediately tied, if it bleeds freely—in general there is no necessity for a ligature; this lays the *aponeurosis of the external oblique,* which forms a dense and distinct covering, bare. The operator is next to make a small opening into this fascia in its middle, into which a director is to be introduced, so as to dilate it upwards (not of equal length with the first) to within an inch of the abdominal ring; this exposes the *second covering* of the sac, the *cremaster muscle,* which is to be divided precisely in the same cautious manner: not the least difficulty will be experienced in separating it from the parts underneath, as the connecting medium merely consists of loose cellular substance. The cremaster will be found as dense as at the first, if the disease has long existed, and the best way to make an opening into it, is to nip it up between the fingers, and then introduce the point of the instrument carefully. Covered as these parts are by blood-vessels, it must evidently be an operation rather difficult; but keeping in mind the above coverings, it will be made much easier. The next part of the operation, is to divide the sac; for this purpose nip it up between the finger and thumb, in order to clear it from the intestine, and then make a tolerable sized opening for the director; this division is to extend to the inferior part of the sac and upwards to within an inch of the abdominal ring: keeping the knife in an horizontal direction, the water immediately escapes. Another mode, is to embrace the tumour behind, and press the fluid forwards, so as to feel a fluctuation, thus preventing any injury being done to the intestine in dividing the sac. As soon as the sac is opened, the intestine and omentum are discovered, the latter enveloping the former, and the intestine occupying the upper and back part. In making the first incision, nothing impedes the operation more than the division of the external pudendal artery, as I have above remarked, in cutting through the integuments: to ensure future success, it is preferable to secure it immediately.

After the operator has observed in what direction the omentum runs, he is to endeavour to ascertain the seat of the stricture by the introduction of his finger between the omentum and hernial sac upwards; if it is at the abdominal ring, he is to introduce a director, or what is still better if it can be done, the finger into the neck of the sac within the aperture of the ring, and guide a blunt probe-pointed bistoury on the groove, in the direction the stricture is to be *divided, directly upwards,* or, as some say, *upwards and outwards.* Mr. Astley Cooper adopts, and recommends the cut to be directly upwards; and the peculiarity in his plan is this: he divides the sac to within an inch of the abdominal ring, the finger of the operator is to be introduced into the sac, and when the stricture is felt, a probe-pointed bistoury is to be conveyed *over the front* of the sac *into* the ring, *between the sac and the ring*, and the ring only he advises to be divided *directly upwards* in the centre of the middle of the sac, sufficient to allow of the protruded parts being returned into the abdomen: others advise dividing the hernial sac with the stricture as far as it extends. Cutting directly upwards will not endanger the epigastric artery even in those less frequent hernia where the sac protrudes on the inner side of this vessel: the only danger in fact that arises from either mode of dividing the stricture, is incurring some risk of wounding the intestine.

Supposing the stricture to be near the internal ring, then the bistoury is to be passed up to the part *within* the sac, as countenanced by Mr. Lawrence, and according to Mr. Cooper between the front of the sac and the abdominal ring till it arrives under the stricture formed by the lower edge of the transversalis and obliquus internus; the edge of the instrument is then to be turned *forwards*, and the stricture divided *upwards*—this is the difference, Mr. Cooper does not cut the sac, Mr. Lawrence does. The bistoury, according to Mr. Lawrence, is either to be introduced on the finger, with the blade turned towards it, or on a director, and divided upwards and outwards. Mr. Cooper here introduces his finger into the hernial sac, and the bistoury between the front of the sac and abdominal ring, carried on the flat side, then turn it to cut, and change it to the flat side in withdrawing it. It becomes a consideration when the stricture exists at the inner opening, where the cut to divide it can be made, on account of the epigastric artery, as it sometimes deviates from its ordinary course, and is found on the outer side of the sac; here, if the incision is made towards the spinous process of the ilium, the chances are that the artery is divided; and the same accident may happen, supposing the artery to be on the inner side, and the cut is made in that direction. There is one general rule to be adopted, which is to take the middle course, and divide *directly upwards*, as there is no instance adduced of the artery passing over the sac. Though some are of opinion, that the division of the epigastric artery is of no serious consequence, yet I conceive such gentlemen to be devoid of that necessary ingredient, common sense. Several divisions of this vessel have occurred, one of which has been related by Mr. Lawrence, and two by Mr. Astley Cooper: in Mr. Lawrence's case, the surgeon, not content with having divided the stricture, made another cut on the inner side of the sac, and wounded the artery: it immediately retracted, and the patient soon died from the hæmorrhage. In another case, in a woman, she lived but a short time; but in the third, though the patient recovered from the accident for a while, the hæmorrhage being with difficulty stopped, yet the excessive loss of blood produced a dropsy.

I do not myself see the necessity, in any operation for hernia, to run such a risk by cutting inwards, even if the artery ran on the other side.

Having divided the stricture, if there be still an incapability of returning the intestine, the operator must look for a membranous band, which is easily seen by pulling down the gut, and carefully dividing it.

The state of the prolapsed parts are to be then examined, and prior to dividing the stricture, I should not conceive it proper to do so, as no correct judgment can be formed while there is an obstacle to the free return of blood. If the intestine be mortified, it will have several purple spots on its surface, which assume a chocolate colour previous to the removal of the stricture: on putting the finger on the mortified part, sometimes only coagulable lymph will be found; but in case you cannot peel this off, do not return it, but adopt the following treatment: if a *small portion* of the cylinder be diseased, a ligature is to be passed through the attached mesentery, at right angles with the intestine, and then through the hernial sac; by which means the intestine becomes confined to the aperture, adhesions form, and an artificial anus is produced; the opening has closed in some few instances after a time, and the fæces have resumed their natural course: but when the *whole cylinder* is mortified, the diseased part should be cut away, the divided ends brought together and united by four ligatures inserted at proper or equal distances around the intestine, cutting the ends of the ligatures close off. But it would appear, from the experience of others, that the practice they adopt, is this—first divide the stricture so as entirely to remove the cause of strangulation; and secondly, make an opening into the intestine, so as to communicate with the abdomen: if the stricture only is divided, the constipation, hiccup, and vomiting continue; but if the intestine is opened, these symptoms, in the course of a few hours, are relieved. I may further observe, that in case of there being much intestine down, and only one gangrenous spot, an opening ought to be made here, and a corresponding one in the integuments, for the fæces to pass, and not attempt to return the gut, as this will be glued for a time, and the fæces discharged by the opening. But supposing it did not adhere, and that there was a large spot mortified, still from the valuable documents I have by me, I should be disposed to recommend the adoption of a similar practice, leaving the intestine undisturbed, as several instances are known where patients have died when the gut has been returned. A difficulty arises when the intestine adheres to the mouth of the sac, which is not easily got rid of; and it frequently happens that a patient dies from this cause after the operation: if the adhesions are short, they may be separated with the finger, otherwise with the knife: but if, after all, in pulling down the intestine, further adhesions are still found higher up, though it is attended with some risk in exposing so much intestine—still as no fæces will pass if the intestine is returned into the abdomen in folds, there will be a necessity of dividing the whole of the stricture. Mr. Lawrence objects to the practice of using sutures to bring the ends of the canal together. The stricture must be divided, but the progress of the cure should not be left entirely to nature: where the intestine has not already burst, the fæces should be evacuated by an opening into the mortified part. If there be a great deal of omentum down, diseased, thickened and indurated, it will be right to cut it away, as large quantities may be removed with impunity. If hæmorrhage of any consequence should ensue, fine ligatures should be used; otherwise mere laceration of the vessels with a pair of forceps, will suffice. The removal of omentum does not add to the danger. It will be right not to return the remainder into the abdomen, but let it adhere to the mouth of the sac, by which, future descents are rendered less liable to happen. Should the portion of omentum be not large, but considerably hardened, still it will be improper to return it, as the scirrhous state of it will most probably irritate the peritoneum; when mortified, it should also be removed, though Mr. Hey has recommended a ligature to be put on, in order, as he infers, to produce sloughing: but if you do this around the sphacelated part, it is of no use, as no ulceration will be effected, and if it is applied on the living portion, you reproduce stricture, and consequently render the operation nugatory. In a patient under Mr. Chandler's care, it was found that the man was at first materially relieved, but after a ligature had been put on, on the above principle, symptoms of strangulation appeared, which proved fatal in eight days. It is very different from tying a single artery, and I may here add, that in a case where no ligature was applied, and the mortified portion was left to slough off of itself, a great deal of time was required for the accomplishment of this process: the subject was a woman. Inflammation came on after the operation, the omentum appeared at the wound, and gradually became removed, and it was from six to seven weeks before she recovered. The fact is, that unless the powers of the constitution are very strong and vigorous, there is a probability of your patient's becoming exhausted.

The operation being now detailed, with the necessary observations that ought to guide you in its performance, the integuments are to be brought together by ligature and adhesive plaster, and a recumbent posture must be strictly enjoined, for fear of another descent of the gut, which actually occurred in a patient of Mr. Cline's, in his attempting to remove to the night-stool: it was, however, soon returned. Opium used to be given, to allay irritation; but, in my opinion, from what I have observed in the practice of the London hospitals, medicine is attended with little advantage. Purgative medicines ought not to be directly administered, as the bowels are generally lax at first: if, however, it be deemed necessary to procure alvine evacuations, it should be attempted by means of a glyster, *as medicines given by the mouth* are apt to excite vomiting.

Some immediately set to work after the operation is performed, to procure evacuations from the bowels by means of castor oil, common salts, &c. until every doubt has ceased of inflammation of the bowels and peritoneum. Keep your patient on the antiphlogistic plan strictly: if inflammation takes place, endeavour to subdue it by general and local bleeding, fomentations, immersion in the warm bath, glisters, &c. The practice requisite must be prompt and decided. When you rationally conclude the danger is over, it will be prudent to reverse the treatment. The bark may be ordered, combined with wine, porter, cordials, and, in fact, altogether a generous diet. Some give a saline medicine with opium, to allay sickness, and should too profuse a diarrhœa come on, aromatics, or the confect. aromat. with opium, will be useful.

A truss should be put on during the healing of the wound, for the purpose of glueing the sides of the sac together, and this has been effected in several instances, so completely that hernia never afterwards descended; at all events, the danger of a future descent is lessened, should perfect success not attend its application.

The following case, detailed by Mr. Astley Cooper, will shew the inutility of taking the sac away. He attended, with Mr. Holt, a woman, on whom he was called to operate for female hernia, and it struck him, that it would be a very favourable opportunity to see how the case would succeed by dissecting away the whole sac, which was accordingly done: some little time after, on directing her to stand erect, the hernia appeared as large as before, and shortly another portion of peritoneum descended.

LECTURE XXV.

OF LARGE INGUINAL HERNIAS.

In very large and irreducible hernia, the belly becomes diminished, after some time the muscles sink in, and there is but little room for the return of the prolapsed parts, supposing it were to be attempted. When strangulation exists, the usual method of operating is not adopted; Mr. Cooper, Dr. Monro, and others, here follow Petit, which consists in dividing the abdominal ring without opening the sac, on account of the admission of air into the peritoneal cavity being thus prevented: but when the stricture is placed at the upper part of the sac, the division of the ring can be of no service, and consequently, ought only to be performed when the rupture is of great size, and the sac not adhering to the intestine. The operation is performed in the following manner: a small opening is to be made into the tendinous covering of the sac three-fourths of an inch below the abdominal ring: then a director is to be introduced into the ring, and a probe pointed bistoury carried along it with which the ring is divided: the tumour is then to be embraced, and the parts returned into the abdomen: this operation has been done several times, both by Mr. Cooper and others, and generally speaking, successfully.

SMALL HERNIA NOT PROTRUDING THROUGH THE RING.

Hernia is now and then so small as not to pass through the external ring, yet becomes strangulated, and a little tumour observable, which, with concomitant symptoms, leads the surgeon to the seat of the disease. Here an incision must be made upon the tendon of the external oblique, parallel to the course of the canal, or course of the spermatic chord, and having laid bare the sac, cut it open; you will then ascertain the seat of the stricture to be at the upper part of the canal, or internal ring, which is to be divided *upwards and outwards.* As the hernia is oblique, the artery will be found on the inner side: but should any doubt arise, by all means cut *upwards.*

OF DIRECT INGUINAL HERNIA.

In dissecting a man at Chelsea Hospital, many years ago, Mr. Cline, sen. states, in his valuable Lectures on Hernia, that he found the epigastric artery to be seated on the outer side of the hernia, a thing of course which surprised him, as being a circumstance thought extremely rare at that time, though from minute investigation since, many other similar cases have been discovered. It is of the utmost importance to distinguish this species from the common, or oblique hernia, as otherwise, in dividing the stricture outwards, still recommended by some surgeons, a great risk would be incurred of cutting through the epigastric artery. The *diagnostic* marks are, that here the spermatic chord is always on the *outer* side of the sac, instead of being on the *inner,* as in the oblique hernia; of course the sac is situated between the chord and the symphysis pubis: in this species there is generally no distinct tumour above the abdominal ring; but this last is not so certain, for though the hernia may be at first oblique, yet, after a time, from the approximation of both openings, the obliquity is in some measure lost, and less perceptible.

When called to a patient under this kind of rupture, and it is easily returnable, apply the direct truss, the pad being at right angles with the spring, for this reason, that as in the oblique hernia you want to press upon the whole inguinal canal, here the pressure is only required rather above the abdominal ring. When strangulation exists be not too hasty in concluding the gut is returned after efforts have been made to this end, as it often lies concealed in the tendon of the transversalis muscle. In every instance that has come under Mr. Astley Cooper's cognizance, he states, the stricture has been in the tendon of the transversalis, and all that is necessary is, after the integuments, &c. have been divided, to pass a director into the abdominal ring and cut directly *upwards*, though it may be equally safe to make the incision *inwards;* but the other, as a general rule, should rather be adopted, because, being attended with no risk, it is not worth while to deviate in the least.

Inguinal Hernia is not so frequent in the female as in the male: when in the former it constantly takes the course of the ligamentum rotundum, anterior to the iliac artery, and behind the tendon of the oblique, and appears at the ring in them: it is rarely of considerable size; the largest I have ever seen was in Guy's Hospital, and the attention of students some years ago, was directed to the case by Mr. Cooper; it reached half way down to the knee, and it had an opening at the anterior part, which discharged feculent matter. This hernia in the reducible state requires the same kind of truss as in the male; in the irreducible, a bag truss; and when strangulated, a similar operation to that described for the male. There is, however, some kind of difference as to the coverings of the hernia. The tumour appears in the labium, and in dividing the integuments to the most depending part, you will expose the covering given off by the external oblique; after its division the sac directly comes in view, as there is no cremaster muscle, so that more caution is requisite here. In cutting open the sac, it is preferable to do so at the lower part, as there is commonly much water found there. The stricture is mostly found at the upper opening between the pubis and ilium. The finger can be readily introduced three quarters of an inch into the sac without entering the abdomen; after it has passed up to the mouth, carry upon it a probe-pointed bistoury, and dilate the stricture towards the ilium; but if any doubt should exist, do it upwards. Should any fear arise with respect to the intestine being entangled, it would be advisable to divide the tendon of the external oblique up to the mouth of the sac, which will expose the stricture; but this should be avoided if possible, as future inconvenience is likely to arise. The truss to be worn after the operation is the same as that in the male.

HERNIA CONGENITA.

I am not aware that this species of hernia was at all satisfactorily explained till the time of Dr. and Mr. Hunter, in 1762, and 1764. It is founded upon the descent of the testes, which generally takes place between the seventh and eighth month, from the abdomen into the scrotum: it is in consequence of the tunica vaginalis not being closed prior to birth, that this kind of hernia takes place; a portion of the intestine gets down from the efforts of the child in crying, the omentum rarely reaches so far: here the tunica vaginalis is the hernial sac. In the descent of the testicle, a portion of peritoneum is carried before it into the scrotum, which receives the name of the tunica vaginalis reflexa; *independent* of that peritoneal investment it originally had while seated in the loins, which is called the tunica vaginalis propria. It must appear evident, that the communication with the abdomen remains open, and does not become closed as is mostly the case before, or at all events, soon after birth, so that this cavity remains unobliterated. It does not so frequently occur on the right as on the left side. It is not always observable at or soon after birth. Whenever it happens at a remote period of life, it must be in consequence of some great exertion, and also from the cicatrix, by which the original opening wassh ut up, being naturally weak. The time it *generally* is discovered is some months after birth. Mr. Hey saw a case in a young man sixteen years of age, whose right testicle had descended but a short time previous to his being subject to this disease.

Mr. Lawrence details a case of an infant, of the tender age of fourteen months, having a strangulated bubonocele, so that we are not, in every case of rupture in early life, to conclude it to be congenital, although, generally speaking, we should be correct. This species takes the course of the spermatic chord, with the epigastric artery on the inner side. The diagnostic marks are more difficult to be defined in this, than in the other species of hernia, from its being so deeply buried. On attempting to grasp the tumour, it has the feel of a thickened chord; and the testicle is so involved as to be very indistinct, and generally somewhat wasted, so as to lead the surgeon to suppose some disease of the chord existed. It has been mistaken for inguinal hernia, and the operation performed.

In the *reducible* state it requires the oblique truss. In the *irreducible*, the same treatment is proper as has been already noticed; but it is somewhat different when *strangulated*, as the surgeon has not the same power of reducing it as in the other species. The stricture is generally at the upper opening, and rarely at the abdominal ring, for this reason, that the parts, from the long application of a truss, become so much thickened as to prevent its occurring in the last stated situation.

In *operating* the cut is not to be made so low as the testes, and it is necessary to have a sufficient portion of the tunica vaginalis to cover the testes; but it should, at the same time, be recollected, that the incision must be carried downwards, rather more than an inch from the abdominal ring. After the stricture is divided, which is to be cautiously done with a bistoury, carrying a finger or director to serve as a guide, return the contents.

There is another species of hernia lately discovered by Mr. Hey, of Leeds, which is called the ENCYSTED: in which there is a complete cyst within the vaginal tunic, forming the hernial sac. The manner in which it occurs is this:—the tunica vaginalis, instead of being closed at its orifice perfectly, adhesions form across it, shutting up the ring: these adhesions become elongated by the pressure of the intestine, and a pouch is formed, which, by continual pressure, becomes so extended as to reach as far as the testis itself. When a hernia of this kind becomes strangulated, it renders the operation more complicated and difficult: the only peculiarity is the additional covering.

LECTURE XXVI.

ON FEMORAL HERNIA.

It is necessary that the anatomical structure of the parts concerned in this species should be well known, and this anatomists have considered somewhat difficult to make intelligible and understood.

From Poupart's ligament two portions of fascia pass *upwards*, the fascia transversalis and iliaca: and one downwards, the fascia lata, which is given off from the greater part of the ligament, and covers the thigh. The inner part of this fascia forms a thin edge, which Mr. Hey has called the femoral ligament, and which he wrongfully supposes to be the cause of stricture.

Another portion of fascia coming from the pubis, unites a short distance downwards from Poupart's ligament with the inner edge of the fascia lata, under the vena saphena major, and thus a *space or opening* is left between the junction of the two portions and Poupart's ligament, which is named the falsiform, or lunated edge of the fascia lata: through this opening the vein issues forth;—the absorbent vessels also pass here, and terminate in the groin; and it is through *this opening* that the femoral hernia descends and becomes situated *over*, not under the fascia lata.

In cutting through the fascia lata, half an inch below the falsiform process, a second portion of fascia will be found to be given off from the back part of Poupart's ligament, which forms the sheath of the femoral vessels; and it is *into this sheath* that the hernia descends. The anterior crural nerve forms the boundary of the sheath on the outer side, and the triceps and pectineus muscles on the inner. On cutting open the sheath, the femoral artery, vein, and a branch of a nerve will be found: the sheath is continued down the thigh, and in the operation for aneurism, it must be carefully opened to detach the vein and nerve from the artery. The sheath communicates with the abdomen, which may readily be ascertained by introducing one finger.

The sheath lies about half an inch behind the fascia lata, and is the *proper* covering of the sac; from a want of a knowledge of this circumstance, femoral hernia has been returned into the abdomen strangulated, the surgeon having supposed the stricture to be divided.

The hernia first descends between the border of Gimbernat's ligament (which is nothing more than the lower edge of Poupart's, and which turns from the pubis backwards), the femoral artery on the inner side, and the vein on the outer. It begins to elongate after it has got about half an inch from Poupart's ligament, and forms a kind of pouch. At the upper part of the sheath there are various openings for absorbent vessels, which renders it rather weaker there. As soon as the sac has passed through the opening in, or rather formed by the fascia lata, as previously described, it becomes turned over it, the orifice of the sac being below, the body above; thus it turns upwards and backwards. After it has pushed forwards and turned upwards upon the tendon of the oblique, it is covered by an aponeurosis as in inguinal hernia, which may be termed the superficial fascia. On cutting through the integuments this aponeurosis is exposed, which being next divided, the crural sheath comes into view; between this and the hernial sac is a quantity of fat, which, in several instances, has been mistaken for omentum; divide the sheath, turn this fat aside, and the sac is brought into sight; on its division the contents come into view, and the orifice of the sac will be found embraced by the sheath. The seat of stricture is sometimes deeper, but less frequent than the former; Mr. Hey supposed from one quarter to half an inch below the falsiform process: there is an opening which is formed by the passage of the hernia in the crural sheath, and this is the seat of it, the division of which renders the prolapsed parts easily returnable. Should this division not succeed, carry one finger behind Poupart's ligament, and its posterior edge will be found to be the seat, which is turned back upon the pubis, called Gimbernat's ligament.

DIAGNOSIS.

A psoas abscess has the same seat as femoral hernia; it comes down on the inner side of the femoral vein, between it and the pubis: it also dilates by coughing, and though in the recumbent posture it is not completely returnable, yet in some degree it is so: it may be distinguished from hernia by its being accompanied with considerable pain in the loins, and the impossibility of returning it all into the abdomen: besides, should any doubt exist, wait a little while, when, from the considerable enlargement of the abscess, its nature will be obvious. With a bubo, femoral hernia is liable to be confounded; and a patient in one of the London hospitals, actually was poulticed by a surgeon, who imagined the tumour to be a bubo; the operation for hernia was subsequently performed. In another case, an opening was made through mistake, and the patient had an artificial anus. On the other hand, I have read of a truss having been applied on a bubo, which is equally as ridiculous.

Treatment.

If the hernia be *reducible* the oblique truss ought to be applied, which frequently succeeds in preventing future descents. If *very large*, the same kind of truss as ordered for direct inguinal hernia. Femoral hernia is seldom cured by wearing a truss, however ingeniously constructed, owing to the variation of position in Poupart's ligament, being sometimes increased, at others lessened in its diameter, in consequence of the powerful action of muscles.

If the hernia be *irreducible,* and the contents consist of omentum only, an oblique truss will answer with the alteration of having a kind of cap, so as to make slight pressure, and at the same time defend the hernia: the pad is to be put on after a time: by this arrangement the hernia will be much diminished from the absorption of omentum, though a portion will still remain in the sheath; that part pushed forward through the falsiform process, and lying on the outer side of the fascia lata, will be nearly removed, in some cases entirely so.

When *strangulation* takes place, the treatment will be very nearly the same as described for inguinal hernia; but the employment of the taxis, in the first instance, varies a little. It is to be performed thus: —Standing over the patient, put two fingers upon the tumour and press *downwards in a direct line,* by which the prolapsed parts are pushed into the femoral sheath; then pressing *upwards,* they are returned into the abdomen. If success be attempted by kneading it upwards at first, the surgeon only forces the tumour over the ligament, and hence it will be further from the opening into the abdomen than at first; for femoral hernia takes, instead of a direct (as many imagine), a curved course; the upper part being under, and the lower part over, Poupart's ligament. If the taxis fail, all the other means must be had recourse to, except the application of ice, which is not equally beneficial here as in inguinal hernia; because, in the scrotum it produces a regular contraction; but here is no portion of skin so arranged around the hernia to allow of any pressure. The tobacco glister must not be forgotten, and if prudent means, continued sufficiently long, fail of affording relief, the operation is the dernier resort.

Operation.

A cut is to be made one inch and a half long, at right angles with Poupart's ligament, as far as the middle of the anterior part of the tumour; a transverse incision is then to be made at right angles with this, and the two corners of integuments are to be dissected up, in order to expose a considerable portion of tumour, otherwise, from its depth, and especially in a fat subject, the operation will be extremely difficult; a thin covering then comes in view, which is the aponeurosis of the external oblique, or fascia superficialis; a small opening is to be made through it, into which a director is to be passed, and by carrying a probe-pointed bistoury along the groove, this covering is to be divided. The crural sheath, or fascia propria, is then exposed, which is to be cut through in the same cautious manner; then instead of taking hold of the sac with a pair of forceps as usual, nip it up between the finger and thumb, in order to separate it from the intestine. The knife is then to be carried horizontally into the sac, so as to make a sufficient opening for the introduction of the director, along which the probe-pointed bistoury is to be passed, so as to dilate the sac completely. The greatest caution is here required in opening the sac, as the intestine is in close contact with its inner surface. Having proceeded thus far, and turned the gut on one side, introduce one finger in a gradual manner, and the usual seat of stricture being found, the flat side of the bistoury is to be carried upon the finger into the orifice of the sheath, and with a very slight movement the stricture is to be divided as far as Poupart's ligament, so as to allow of the hernia being reduced; in doing of which the knife is not to be passed into the abdomen at all.

Mr. Hey recommends cutting *directly upwards*, which is certainly a safer practice than the usual one of dividing the stricture upwards and inwards, even when there is a variety, which I shall hereafter notice. But supposing the stricture not to be in the above direction, feel for the orifice with a director, and then carrying the finger quite into the abdomen, it will be found *behind* Poupart's ligament. The knife is to be carried behind its posterior border with its edge uppermost, and the stricture is to be divided *upwards and inwards*, letting the umbilicus be the line for the incision. The operator must carry his finger one inch and a half into the crural sheath, before he reaches the tendon of Poupart's ligament. The incision should not, upon any consideration, be made towards the pubis, for the danger here is so great, and comparatively speaking, so trifling when in the other direction, that no man who feels for his patient would, for a moment, think of doing so. The operator is under the necessity of pushing his finger very deep into the sac, and although care would be taken, of course, to avoid the intestine, still, as the knife is passed in a concealed way under the intestine and omentum, the former is very liable to be wounded. I recollect a case mentioned of a woman, who had the gut cut into in three different places, by which the fæces were discharged into the abdomen, and she did not survive six hours.

The following case will shew the absolute necessity of perfectly understanding the anatomy of the parts concerned in femoral hernia, as well as the morbid anatomy of those parts. The case is detailed by Mr. Cooper. A woman had the operation performed by a surgeon; she experienced no relief whatever from it;—on consultation, there could be no doubt the formidable symptoms arose from violent inflammation. The woman died soon afterwards, and on examining the body it was discovered that the covering of the sac was gone; on looking further, the sac was found pushed into the abdomen *unopened*, so that the stricture still existed. The intestine was mortified. The fascia propria was also pushed back, but it had been opened.

There is not the least risk of either wounding the epigastric artery or vein, unless the cut is made outwards, which no man in his senses would think of doing. This artery passes on the outside, but at an extreme distance from the mouth of the sac. Preparations are apt to give a wrong idea of its situation. It is only by making an extensive incision towards the spine of the ilium that it could be wounded, and in doing of which a risk would be incurred of wounding the femoral vein. The spermatic chord is quite out of the reach of the knife, and it scarcely requires notice, as femoral hernia is most common in females, where no chord exists, and in males it crosses over the anterior part of the sac, at such a distance, and so far behind Poupart's ligament, as to be entirely out of the way; supposing, however, the orifice of the sac to be so large as to lead to a fear of doing so, pass a director under Poupart's ligament and divide the ligament; but this, I believe, never will be found necessary.

There is a variety now and then seen in femoral hernia, where the obturator artery passes over the sac, but were this more frequent than it is, still I conceive it ought not to be an obstacle to the present mode of operating; as the stricture is commonly in the crural sheath; but even if it were at the posterior edge of Poupart's ligament, still no risk would be run of wounding this artery, unless the knife was carried far into the abdomen.

There is a circumstance occurring in femoral hernia which every surgeon ought to be aware of, that previous to the division of the stricture a pulsation *cannot be felt*, either in the obturator or epigastric arteries, these being situated above.

With respect to a preparation sent to London formerly by Dr. Barclay, for the purpose of having a drawing made, in which the obturator artery passed over the sac, Mr. Cooper has dissected many cases, and never found this to be the case; but if it should, the stricture ought to be divided as usual.

The subsequent treatment will be similar to inguinal hernia.

UMBILICAL HERNIA.

This species is to be classed next in frequency to inguinal, and if the numerous instances of its existence in children are taken into account, I think it is equally as often met with in practice.

The umbilicus, or navel, was originally an opening into the fœtus, through which the umbilical vein and arteries passed. After birth the vessels degenerate into ligaments in the abdomen, and the opening is closed, like a ring, in the middle of the linea alba; the tendinous fibres are very firmly connected together in this place, yet they occasionally give way, and furnish an outlet for the abdominal viscera, which constitutes the umbilical rupture, or hernia. It is to be recollected, that this hernia does not consist in the rupture of any part to allow the viscera to protrude. The tendinous fibres lose their strength, and constant pressure causes them to be elongated, or to separate from each other; when this happens, the peritoneum always goes before the protruding viscus, and forms the hernial sac. This rupture now and then runs through families, owing to several causes: first, original malformation, which may either arise from a deficiency of muscular or tendinous structure, of which I have heard cases of such, and seen one; or secondly, when the umbilicus was at first particularly large, and the opening of course in proportion; but from the funis diminishing in size, greater space is left; or thirdly, an accumulation of adeps in the omentum or mesentery, which is not unfrequent in females, from their greater disposition to its formation than males; or fourthly, and lastly, from utero-gestation, by which the viscera are thrust into a very small space.

Umbilical hernia sometimes attain an enormous size. I recollect a case where the peristaltic motion of the bowels could plainly be seen; it hung down to a considerable extent, was smooth, and scolloped like a melon.

Treatment.

In the *reducible* state in infancy, after the contents are returned into the abdomen, apply to the part the flat side of an ivory ball, which has been cut into two parts; or a piece of cork over this adhesive plaster, and a belt to confine the whole, having two straps to pass between the thighs and one over the shoulders to prevent its slipping. When from a deficiency of muscles, the integuments are thin, it is advised to cut a piece away and bring the parts together by suture. There are cases detailed, one by Dr. Hamilton, one by Mr. Blizard, and others by surgeons whose names I do not recollect, in which the practice proved successful: a very favourable opinion is entertained of it by the profession.

In the adult, the best plan, if the hernia be small, will be to apply an ivory ball, as in infancy, after the contents are returned. A mere pad of wool, put on, and confined by a girth, has succeeded; but this pre-supposes a cavity, into which the hernia sinks. The hernia now and then projects here: a circular truss, like that in inguinal hernia, is proper: but the greatest difficulty is in women, when the abdomen is considerably enlarged; here a girth is to be put around the body, having a pad in the middle to cover the hernia; at its inferior part is to be a shorter band, which passes under the pendulous part of the belly: the upper one goes round the back, and is buckled.

When the hernia is *irreducible*, and of considerable size, a cap, made of copper, and lined with leather, should be put on the tumour, with a bandage under it, and a belt over the shoulders, otherwise ulceration will take place.

It is not unfrequent to find a strangulation through an orifice in the sac forming a pouch, so that a part of the contents can be returned, and yet the symptoms of strangulation still exist.

When the operation (which is rather simple) is necessary, it may be done thus: make a transverse incision across the middle part of the tumour, and carry another from this to the lower part, so as to form two flaps; then open the sac carefully, and having found the seat of stricture, divide it above and below, as there is no danger of wounding any vessel: return the contents, and bring the flaps down, so that the process of adhesion may take place. In case the hernia is very large, and has long been irreducible, cut down upon the upper part of the tumour, which lays bare the linea alba above the aperture, into the abdomen; having exposed it and the sac, introduce a probe-pointed bistoury between the two; but do not cut into the sac, only, as in large inguinal hernia, divide the tendon of the external oblique muscle.

VENTRAL HERNIA.

This is very nearly the same as the umbilical, only that it occurs in the linea alba, linea semilunaris, &c. An artery and vein frequently pass through these tendons, but do not completely occupy the opening, which, from malformation, allows the passage of the hernia. The linea alba has been seen deficient from the umbilicus to some distance.

Treatment.

A very broad belt is to be bound round the body, after the contents are returned, and constantly worn. The operation has been performed, although very rarely. In operating, supposing the hernia to be at the lower part of the linea semilunaris, divide *upwards*, as the epigastric artery lies contiguous. With respect to the other varieties in situation, no particular observations will be required.

PUDENDAL HERNIA.

The hernial sac protrudes on the inner branch of the ischium; it occurs very rarely. Mr. Cooper saw a case strangulated; it appeared at the labium; he reduced it, and in doing so, he found that his finger had passed up to the vagina to the pelvis: a sponge was ordered to be applied. A gentleman, whose name I do not remember, relates a case where the bladder occupied the part.

PERINEAL HERNIA, &c.

A case of this kind was discovered in one of the dissecting rooms. A tumour was observed between the bladder and rectum; it nearly reached the apex of the prostate, and on examination, it proved to be an hernial sac, containing a portion of intestine.

The *vagina* is sometimes pushed forward by hernia, situated between it and the rectum: a case of this kind occurred at Guy's Hospital, in a girl: when she stood upright, the tumour appeared on the outside of the labia, but was easily returned in an horizontal posture by pressure on the upper part of the vagina. A pessary was ordered to be worn. This species of hernia now and then causes suppression of urine.

The existence of hernia at the *foramen ovale*, cannot be ascertained in the living subject, consequently no operation can be performed. It is always very small.

Hernia at the *ischiatic notch*, descends and rests upon the sciatic nerve, between this and the obturator and gluteal arteries; the latter being above, and the pyriformis muscle below: if it should happen to be very large, it may be operated on; but it very rarely occurs.

I have been shewn two specimens of hernia through the *diaphragm.* In hernia of the *meso-colon,* and *mesentery,* a separation of the laminæ takes place, forming an aperture into which the hernial sac protrudes.

LECTURE XXVII.

ON DISLOCATIONS.

There are very few accidents so likely to be mistaken, and their nature properly ascertained, as dislocations, and they are sometimes found extremely difficult to be reduced, and have baffled the skill of some surgeons completely. A slight sudden force will produce such an injury when the muscles are unprepared.

The lower Jaw.—This bone is often dislocated, either from yawning, or a slight blow received on it when the mouth is open, by which the condyloid processes slip under the zygoma; one only, or both condyles may be thus displaced: if both, the nature of this accident is very obvious: the patient cannot shut his mouth, and the under teeth project much more than the upper forwards; if on one side only, the mouth is turned to one side. To *reduce* it, put handkerchiefs round your thumbs, or thick cloths, then grasp the dislocated bone firmly on each side; the condyles are to be then depressed, and the chin elevated. The thumbs are immediately withdrawn, as they would be in danger of being wounded unless protected, as I have described, from the force and violence with which the ends of the bone slip into their places. If it be difficult, take a piece of wood, and put it between the molares teeth—direct a person to go behind, and hold the patient's head steady—then put your hands under his chin, and lift up his jaw as much as you can, and by means of this lever it is tilted into its place.

CERVICAL VERTEBRÆ.—Dislocations between the first and second cervical vertebræ, produce instant death; the dentiform process is broken off: this is the only part liable to such an accident; all other supposed dislocations are *fractures* of the vertebræ, and if lower down in the neck, generally prove fatal. The consequences of such an accident are paralysis of the lower extremities, an involuntary passing off of the fæces, and a retention of urine. The reason of the stools passing involuntarily, is on account of the nervous influence which belongs to the sphincter muscle, being suspended by the pressure which the fractured vertebræ make upon the spinal marrow, while the nerves of the intestines are in their functional state, because they have a higher origin. The vermicular motion of the intestines is carried on while there is no resistance to oppose the escape at the anus: the urine is retained, because the nervous energy of the muscular coat of the bladder is interrupted. The first patient that came under my care with this accident, was John Hill: he fell from the top of a cart-load of barley while securing it with a rope, in the field, on the morning of the 16th September, 1816. His fæces escaped involuntarily, and his urine was evacuated with a catheter. Until noon on the 18th his breathing was free and natural, when it suddenly became extremely difficult and laborious till he died, which happened in about an hour. On the 9th of September, 1817, early in the morning, I was sent for to William Williams, who had, in returning home late the preceding night from a harvest dinner, (at which it appeared he had drank freely) fell off a stone stile, and met with a similar accident, at least in the symptoms, to John Hill—a tumour was observed on his neck; his breathing also was not much altered at the time I saw him. I was sent for at four the following morning, as he appeared to experience the greatest difficulty in breathing, which suddenly came on—but before I arrived he died. The injury, in both cases, indisputably happened below the origin of the phrenic nerve, otherwise their death would have been immediate.

If a fracture happen in the back, the person may survive a fortnight; if in the loins three weeks; the spinal marrow is generally ruptured. Very little can be done in these desperate cases; palliatives are all that can be employed; by bleedings, properly conducted; in the beginning a glister, and the introduction of the catheter, at stated intervals, will be right.

CLAVICLE.

A dislocation of this bone, may happen at either extremity; when separated from the *sternum* there is a tumour susceptible, and the clavicle is either thrown forwards or backwards. By drawing the scapular extremity backwards, and making pressure on the sternal extremity, it is easily reduced.

The scapular end is oftener dislocated than the other; it is thrown upwards on the processus acromion: carry your finger along the spine of the scapula to the acromion, when you will feel the clavicle: this accident is liable to be mistaken for a dislocation of the os humeri. By drawing the shoulder backwards, and pressing down the end of the clavicle, it regains its situation. In both these accidents the arm had better be kept in a sling after the reduction: but notwithstanding, deformity very often remains.

OS HUMERI.

The shoulder joint is liable to three different kinds of dislocation; first, *downwards*, which is the most common, into the axilla: in this case the head of the bone is situated between the glenoid cavity and ribs, and there are four signs which will denote the nature of this accident: first, the shoulder will appear sunk and flat, and a vacancy is plainly distinguishable under the acromion; secondly, the elbow *cannot be brought to the side*, because the triceps muscle is on the stretch, which permits this motion; thirdly, the patient cannot bring his hand to the top of his head, neither can it be raised in a line parallel with the acromion; and fourthly, the feeling the head of the bone in the axilla, which will be facilitated by casting the elbow as far from the side as possible; the lower edge of the pectoral muscle is drawn tight—the arm is longer than the other.

Having ascertained the nature of the accident, proceed to the reduction, by placing the patient upon a chair; put a towel in the axilla, under the dislocated shoulder, and tie it tight over the opposite shoulder; then bending the elbow, put another towel round the arm, and let two persons extend this, while two others are to hold the other towel firmly. Now while the head of the bone is pulled out of the axilla by the towel round the arm, the other acts as a lever in replacing the bone. I have seen this dislocation accomplished over the edge of a door or settle, placing a pad underneath in the axilla, to prevent injury: I have myself reduced it, assisted by Mr. Bird, with my heel in the axilla, in the case of Mr. John Lewis, an ironmonger. I have also effected this singly; but in the servant of Mr. John Prosser, miller, I was obliged to use the pullies (having in vain attempted other methods) with success. Sometimes, after reducing a dislocation of this kind, the head of the bone will again fall into the axilla, from the relaxation of the parts; in such cases, a pad in the axilla will be useful, and support the shoulder by placing the arm in a sling.

The easiest mode of reduction is with the heel or knee in the axilla, and extending the arm at the same time; the knee is best in women. The principal intention is to fix the scapula before extension is used. The direction the arm is to be drawn, is in a right angle from the body, and a little downwards. The longest time the bone in this accident has been out and afterwards reduced, is nine weeks and six days.

Second, *dislocation is forwards:* here the head of the bone lies on the second rib under the pectoral muscle, and under the clavicle about its middle: to ascertain it, lay your hand on the clavicle, rotate the arm, and you feel the head of the bone: the signs are, loss of the elevation of the shoulder, the hand cannot be put to the head, and the elbow is with difficulty brought near the side: but still there is more motion than in the former case; but the difficulty in reduction, is greater considerably. The pectoral muscle is here relaxed: the head of the bone can be distinctly felt under the clavicle: neither the heel or knee are useful here. The accident being ascertained, proceed to the reduction, by providing yourself with a kind of girth, with a slit in the middle, through which you are to put the arm of the patient; then buckling and fastening it to a point behind, you thus confine the scapula while the pullies are in action: if it were not for this precaution of fixing the scapula, you would often pull the humerus away, instead of reducing it. You are now to make an extension of the arm by means of a napkin with pullies attached, directly outwards on a line with the side of the body, gradually extending the arm for five minutes, and then slacken them; if the reduction be not effected, put the napkin on as before, and proceed in the same gradual manner; for by a long continued extension, the resisting muscles become tired, and at last allow of the replacement of the bone. I have never seen this species of dislocation reduced without the assistance of the pullies, although very great force had previously been used.

The *third dislocation is backwards.*—It is a rare occurrence. The head of the bone is felt under the spine of the scapula, resting on the dorsum of that bone. The sign is the protuberance which the head of the bone occasions in that situation. To reduce it, the scapula is to be fixed, and extension made directly outwards.

Dislocations of the os humeri never happen without extensive rupture of the capsular ligament; this is never an impediment in their reduction: the difficulty consists in the resistance of the muscles, which should be overcome by address more than by effort.

OF THE ELBOW.

The most common dislocation of this joint is when the radius and ulna are thrown *backwards*, which will be perceived by a great protuberance in a situation rather farther up than the elbow is originally. The coronoid process of the ulna takes the place of the olecranon;—the radius lies backwards on the os humeri: the arm is straight, and the projection of the olecranon distinguishes it. Feel for the rotation of the radius, and if it be present, then that bone is not concerned in the dislocation. The mode of reduction is this: place yourself in a chair, letting your patient remain on the floor; then take hold of his arm, and place your knee in the bend of his elbow; then, by gradual extension, it is reduced. I met with, in my own practice, this accident twice: once in Thomas Watkins the parish clerk, and the other in a Miss Lewis.

When the ulna and radius are out of place, either before or behind, the same extension is to be made as above described; and although they are to one side, as soon as the arm is bent, and extension made, they will come in their places; if *forwards*, which is not at all frequent, a fracture of the olecranon must inevitably happen.

The lateral dislocations are usually incomplete: if of the ulna itself, the coronoid process sinks into the cavity destined to receive the olecranon; if of the radius, the head of the bone is separated from the ulna, and thrown on the fore part of the external condyle: it is known by the arm being a little bent, but cannot be either bent or straightened far:—the motion is thus: the hand cannot be laid either completely prone or supine, therefore the motion of flexion and extension is much diminished. It is with great difficulty reduced. The best way is to place the elbow upon your foot in such a manner that the olecranon shall be fixed from going back; then endeavour to straighten the arm. Some advise a forcible extension to be made backwards. It may be proper, in obstinate cases, to bleed, so as to produce syncope; use the warm bath, a tobacco glister, &c.: in some instances it is incapable of reduction without.

OF THE WRIST.

When it is dislocated, it is either outwards, or as some say backwards, and inward or forward. The injury is very evident. The transverse or lateral ligament, which passes from the styloid process of the radius to the scaphoid bone, is ruptured, by which the hand is distorted. It is only requisite to use simple extension: and after reduction, a splint is to be applied, bound by a bandage to the palm and wrist.

Note.—There is an injury sometimes taking place at the wrist joint, which might be mistaken for dislocation: it is a swelling arising over the wrist joint, generally occasioned by a person putting out his hand to save himself in falling. It may be known from a dislocation, by feeling for the styloid process of the radius, and the root of the metacarpal bone of the thumb, and if they are in a line, it is not a dislocation: this swelling will sometimes require six or even twelve months to subside. From the sprain an inflammation is induced, by which a quantity of coagulable lymph is deposited among the sheaths of the tendons of the flexor muscles of the wrist, which, by its bulk and rigidity, suspends their motions. The treatment consists in the application of the emplast. hydrarg. c. ammon.; and after this has been continued for some time, friction may be used, frequently moving the fingers. Another method, which may be useful by exercising the part, is to have a ball put in the palm of the hand, which the patient should grasp often; and when he is able to do so with a large one, substitute a smaller one, and diminish its size until he recovers the complete use of the flexor muscles.

If the thumb or fingers are dislocated, simple extension will reduce such an injury; and splints, or pasteboard, are to be applied to retain the position afterwards.

OF THE OS FEMORIS.

There are four different dislocations of the thigh bone. The most frequent of all, is that which occurs *upwards.* There are four signs or circumstances which characterize it, and distinguish it from the others; and which should be ascertained.—*First,* whether one limb is *shorter* than the other; in this accident it generally is about two inches, and sometimes even so much as three. 2dly. In this species the knee and foot are thrown over the other leg. 3dly. The trochanter major is resting very near the anterior superior spinous processes of the ilium; and 4thly, the limb is in a fixed state—the head of the os femoris rests on the dorsum of the ilium. This accident can only be confounded with a fracture of the neck of the os femoris; the limb is shortened in both cases, but in fracture the limb is turned outward;—dislocation happens in young people, fracture in those advanced in life.

To attempt its reduction, lay the patient on his side; fix the pelvis by means of a bandage or girth passed betwixt the thighs, between the spine of the ilium and trochanter major; secure it with a handkerchief;—without attending to the fixing of the pelvis all efforts to reduce it will prove abortive. After this is accomplished, fasten another towel or girth, smaller, round the thigh, above the knee; to this girth are straps to fix the pullies, which are to be applied, and make extension in a gradual manner; the direction of the situation of the bone being obliquely upwards and backwards, the other thigh is not to be crossed by making the extension at right angles, but it should be made across about two-thirds or three-fourths the length of the bone downwards, and by using this degree of obliquity its reduction will be accomplished. Repeat the extension rather than use any very considerable force, several times, especially if the bone have been long out. The pullies are not absolutely necessary. Bleeding, previous to the attempt, is useful and mostly required, and if the patient be very muscular an injection of tobacco will be found beneficial; also proper doses of antimon.

tartar. to excite nausea, are useful, as they tend very much to facilitate the necessary exertions.

The *second* species of dislocation of the thigh is *downwards*, into the foramen ovale. The head of the os femoris, in this accident, descends into the cavity of the foramen ovale—the trochanter major is drawn backwards by the obturator muscle. The appearance of the limb is much longer than before, one and a half inch or two inches and a quarter. The knee and foot are turned out, the body drawn forward, and the patient is incapable of straightening himself; this is occasioned by the action of the psoas and iliacus internus muscles,—they pull the spine downwards. This dislocation is the most easy of reduction. If it have recently happened, secure the pelvis by means of a bandage round the pubic region; the surgeon is then to go to the outside of the limb and push it inwards. Supposing it has been out for some time, confine the pelvis by means of a strap; also place a bandage around or across the regio pubis. The first strap is to be applied between the pelvis and thighs; when these are applied push the bone inwards.

The *third* species is *backwards*. In this accident there is scarcely any difference in length between the one leg and the other—if any, about half an inch shorter. The knee and foot are turned *inwards*, but different in appearance to that of the dislocation upwards—the foot is turned *over* the other, the toe resting against the upper part of the other foot. When an attempt is made to move it, there is scarcely any motion. The situation of the bone is thus:—the head of the os femoris is thrown into the ischiatic notch, the trochanter resting upon the side, or a little behind the acetabulum. The mode of reduction is best effected with the pullies. In the first place, fix the bandage between the thigh, so as to secure the pelvis, then apply another around the thighs, and make the extension; instead of doing this so low as the knee, the direction is across the middle of the other thigh, as this gives the head of the bone a direction immediately towards the acetabulum: if the other thigh is crossed so low as the knee the head of the bone is drawn in to the foramen ovale, and then it cannot afterwards be moved without extreme difficulty. After the extension has been made for some time, carry a towel around the thigh, and insinuate your head and neck into it; you are then to place your hands firmly on a table, and elevate the bone as much as possible. Sometimes the pelvis may be fixed by means of the bed-post, as Mr. Hey of Leeds has recourse to, as detailed in his work.

The *fourth*, and last species, is *forwards*. In this case the head of the os femoris is thrown on the body of the pubis; the femoral artery and vein are put upon the stretch, and thrown inwards; the acetabulum is occupied by the trochanter major; there is very little difference in the length of the two legs. The head of the os femoris is distinctly felt in the situation of bubo: the knee and foot are turned *outwards*. In the reduction the pelvis is to be fixed, and a bandage or girth applied round the thigh, to which the pullies are to be attached. The extension is to be made downwards and a little backwards. The patient lying on his side, after continuing the extension for a short time, in order to bring the head of the os femoris near the acetabulum, tie a towel round the upper part of the thigh, and insinuate your head and neck into it, then raise the head of the bone upwards over the edge of the acetabulum till it slips into the socket. If the bone be out for a considerable time, and there is considerable difficulty, carry a bandage under a table on which a person is resting, and by bending the leg till the heel nearly touches the back part of the thigh, and the head of the bone is near the acetabulum, endeavour to tilt it backwards into the socket.

PATELLÀ.

The patella may be dislocated, either *inwards* or *outwards*, from sudden falls, or from a peculiar relaxity of the parts. I have known such an accident to happen, from a very trifling cause, to a servant girl living in my father's service; indeed, the great mobility of her joints was not confined to the knee, but it extended to her wrists and fingers. When the patella is thrown out of its place, the signs are, the bone appearing either to one side or the other, and the straightness of the knee. The mode of reduction is very simple; it consists in pressing down the outer edge of the patella, by this means the inner edge is elevated, while the muscles inserted into it soon bring it into its former place. Extension is sometimes necessary first, before pressure is used. It sometimes happens that there is a laceration of the capsular ligament, by which the patella is drawn up, as in fracture: the same means for restoring it to its situation are necessary as in fracture, and it is afterwards to be retained by proper bandages. In the dislocation, I have above alluded to, it occurred outwards, which is the most frequent accident. It must be retained by a proper bandage, and lotions used of vinegar and water, or the liq. acet. p. dil.

TIBIA.

The dislocation of the tibia may be either *inwards* or *outwards*, or the head of the tibia may be thrown backwards, behind the condyles; if outwards, the lateral ligament is only ruptured: if inwards, the external and crucial ligaments are torn. The reduction is very easy; simple extension, and proper direction of the bone, when carried to a certain extent, is all that is necessary: although rest, at first, will be right, yet I decidedly object to its continuance beyond a certain period, nine days or a fortnight, after which gentle motion must be allowed, to prevent a stiffness.

There is a species of dislocation of the knee joint, first described by that accurate observer, Mr. Hey, in which the semilunar ligaments were so long as to allow the semilunar cartilages to get between the condyles; which causes the condyles to become placed rather sideways in the joint, and which has been named an *oblique* dislocation. The sign is, the knee bent and cannot be straightened, except the body also is bent, as the extensor muscles prevent it. The mode of treatment is, to place the patient on a high seat, and let the legs hang over; then take the leg and bend it smartly as far as you can towards the buttocks, by which means the condyles will slide over the semilunar cartilages.

ANKLE.

The dislocations of the ankle joint are, *first*, where the tibia is thrown *forwards*, on the upper part of the foot. The mark is, the heel greatly lengthened, and in this accident the fibula is broken. In the reduction let one assistant take hold of the foot, and another the leg, each making extension; then the surgeon, with his hand, is to guide the tibia into its place: during the cure the patient is to lie on his heel.

The *second* dislocation of the ankle is *inwards*, and the tibia is thrown on the inner side of the astragulus, together with the fibula fractured just above its base; also that part of the tibia which is attached to the fibula at its lower part, is broken. The mode of reduction will be the same as in the former case—by extension and directing the bone. The leg must rest, during the cure, on the malleolus internus.

The *third* species is *outwards:* in this case the foot is turned inwards on its edge, and the malleolus internus is broken off. The extension must be made as before. The leg must be put to rest on the malleolus internus, and if found to be an uneasy posture, it may be changed, and rested on the externus on a pillow, letting the foot hang over:—it will be some time getting well.

Observations.

After the reduction of each of these, splints are to be used: many prefer the limb to lie altogether on the outside, not the inside, in a bent posture, treating it similar to a fracture. The gastrocnemii, and other strong muscles, must be relaxed in reducing these dislocations.

COMPOUND DISLOCATION OF THE ANKLE JOINT.

A surgeon's character is in great hazard in such a case as this, and it is a most important point in practice here, as well as in compound fracture, to endeavour, after the dislocation has been reduced, by every means to effect an union by adhesion. Patients have been known to die so early as the seventh day, from the surgeon's trying to save the limb, and at other times, where the appearances were quite as bad and unpromising, the limb has been saved and the patient recovered. Now, I will suppose for a moment, in such a case, the limb was to be amputated, from a conviction in the surgeon's mind of its being the best and safest practice; the patient's friends would, perhaps, say that the limb had been removed unnecessarily, and if he should, notwithstanding, chance to die after such an operation, they would say the surgeon had killed him. On the contrary, I will suppose he had tried to save the limb, and the patient had died; they would be ready to say, the surgeon did not understand his profession, and that the limb ought to have been taken off. Now, in such embarrassing accidents, be guided by the following rules. If the patient be old, amputate;—if an adult of a bad habit of body, amputate;—but if an adult of a good constitution, try to save the limb, duly considering the degree of constitutional irritation and fever: if it be not great, the limb may be saved, but the joint will be anchylosed. If the astragulus be also broken, a better expectation may be held out; for in all inflamed joints there must be an absorption of cartilage, and bony granulations formed, which will produce great and excessive constitutional irritation, so much so, that death often ensues; therefore, if the cartilaginous surface of the astragulus be broken off and come away, there will be left only the cartilage at the lower part of the joint to be absorbed; and hence, only half the risk is incurred. In Mr. Gooch and Mr. Hey we have advocates for sawing off the lower end of the tibia, for the above reason: this would seem to be a plausible plan, but I have never heard of its being successfully done. I really think removal of the limb, on the whole, would be preferable in those cases where it might be deemed advisable.

The young, and those who are not irritable, of a thin spare habit of body, are good subjects to endeavour to save the extremity. If amputation be resolved, I am decidedly for its being done immediately: it will be folly to wait till inflammation commences; the chances of saving the limb are few; adopt by all means the decisive and commendable practice of J. M. Larrey; depend on it, more patients are saved by its speedy performance than if deferred to the suppurative stage; when done early, very seldom the patient does otherwise than well. If the wound be contused and extensive, no one will hesitate: here, as in all other cases where joints are exposed, the synovia escapes. In a good healthy constitution, notwithstanding, do not be *in haste* to operate; many cases do exceedingly well, and particularly in country practice, where the air is good.

LECTURE XXVIII.

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INTRODUCTORY LECTURE TO GONORRHŒA AND SYPHILIS.

Syphilis made its first appearance in Europe in 1493 or 1495. Some maintain it was first observed at the siege of Naples, or that, at all events, the followers of Columbus brought it from the West Indies; others consider it of much earlier origin, and that the Greeks and Romans, nay, even the Jews, were afflicted with it. It may be reckoned one of the morbid compound poisons capable of affecting the human body constitutionally, and communicating to others the same disease. The poison itself is known but little, but its effects are very manifest. The virus is always in, or mixed with pus, which shews that it is secreted by an inflamed surface: it always produces a species of inflammation in those that receive it, which is different from any other, having a peculiar action superadded, by which the specific matter is formed after the continuance of it for some little time. Infection may remain, and a capability of giving the disease to others, even when the inflammation has totally disappeared. In order that this poison should act, it must be applied in contact with a part in a state of solution, or mixture, for in vapour it does not give the disease, differing in this respect from small-pox and other poisons. The seat of it is well known to be the parts of generation chiefly, from whence it may be concluded those are its principal residences, and communicated by the act of coition. Its effects on the body are two, local and universal, or constitutional: the effects locally are immediate, the universal are consequent.

The *cause*, both of gonorrhœa and syphilis, were considered the same, that is, to arise from the same poison, though the effects were different, from the mode of action; the reason of which was said to be, that the economy of the parts vary, one being a secreting surface, as the urethra, the other not. It requires only one mode of action to produce the effect on this canal: when any irritating matter is thrown upon a secreting surface, nature, to overcome the stimulus, increases the action of the part, from whence gonorrhœa is formed: when the same application happens to a cuticular, or non-secreting part, nature, not being here possessed of the same advantage as in the former, absorbs that part so stimulated, by which the other disease, a chancre, is formed. The secretion in gonorrhœa is not the natural increased, but one substituted, partaking of the poisonous nature of the stimulant. Thus, any secreting surface, as the eye-lids, will have the natural secretion altered and changed, although the part most readily disposed to receive infection is the urethra.

The poison of syphilis is more readily absorbed from some parts than from others, as from chancre, sooner than from an incised wound; for the incised wound must become of the same nature as the virus before matter is absorbed: this is seen in the inoculation for the small-pox, where the variolous matter is not at first absorbed, but remains stimulating till it has produced an ulcer of the same specific nature with itself before absorption takes place.

Mr. Hunter has, in himself, produced a chancre by matter from a gonorrhœa, and he says, from numberless other experiments, that he is led to conclude there is *no difference:* as he found, indisputably, that the matter from gonorrhœa and chancre were capable of producing the pox. When a secreting surface has set up the inflammatory action, the secretion is always increased, and is at last so much altered as to become exactly similar to that by which it was produced: the matter that it first received stimulated, as it were, the parts to secrete and wash it off; but this does not succeed, as the irritation still continues, and the consequent inflammation occasions a continuance of it, and a succession of the formation of the same pus. The virus is not obliged to the pus, but to the specific inflammation, for the continuance of the action. Some have asserted that the matter in gonorrhœa arises from an ulcerated surface; now, although this might be found to be the case in a few instances, yet, having examined many after death without finding any appearance of ulceration, Mr. Hunter could not but conclude that it is far from being the case in general; besides, if it depended on ulcers, these could not be expected to heal without the use of mercury, whereas, every one who is at all acquainted with gonorrhœa, now knows that it can, and ought to be cured without a grain of this medicine. Gonorrhœa differs very much in the degree of violence of the symptoms in different constitutions, some being much more affected than others: when *mild* it may be called simple; when *violent*, complicated: this would not appear to arise from any alteration, or difference, in the specific quality of the matter, but in the susceptibility of the parts that receive it. A chancre, in some people, will heal up immediately, while a gonorrhœa in the same person will produce the most violent symptoms. In some, a venereal ulcer will heal readily, while a slight wound from any trivial cause whatever, will torment both surgeon and patient. A case is related by Mr. Hunter, of a gentleman, who, from running his spur into his leg, had a very troublesome ulcer, at the same time that chancres were healing with the greatest readiness: he was almost inclined, in this case, to apply venereal matter to the ulcer, for he could not help thinking that it would induce it to heal. Some diseases are capable of curing themselves: nature not being able, or disposed to continue the same action beyond a specified time: if this were not the case, there would be no end to many complaints: this principle is common to many, hence the conquest in gonorrhœa; the power of continuing the action is here gradually diminished, and the cure effected by a natural decay. This cure in general takes place in a secreting part, for a chancre will increase as long as the virus remains unattacked. Mr. Hunter makes it a doubt whether a gonorrhœa would be increased by a communication of the same matter; for when the matter of gonorrhœa, or chancre, has been applied to a bubo, no retardment in the cure has been noticed, the matter thus applied being only a renewal of the same kind it in the first instance was amply furnished with. The poisonous gland and duct of the viper is not stimulated by the fluid it secretes; but if the same be applied to any other part of the animal, different circumstances will occur. When a part has been accustomed to a stimulus some time, it gradually grows insensible of its action; but if there be any interval the part will become almost as sensible as ever. The first infection of gonorrhœa is generally, if not always, the worst, and it is a well-known fact, that the number of claps diminishes the susceptibility and degree of violence.

Notwithstanding it was considered, that gonorrhœa and chancre arose from the same poison, which *I always have doubted,* it would be very difficult for the advocates of the former to explain to me, if such really were the case, why the two species do not attend at the same time, for it is natural to suppose that the one would produce the other, and although cases are related of a chancre coming on soon after gonorrhœa, and vice versa, yet they are not to me satisfactory. I have known a young gentleman contract a clap from one girl, and a chancre from another, two successive evenings. The one girl was known to have gonorrhœa, the other a chancre. I have heard it endeavoured to be explained thus, that the presence of one irritation excludes the other in general; but in this case they were both present, and distinctly contracted.

The constitution will not be contaminated from gonorrhœa —from chancre it will: and although the matter of the latter finds its way, if applied to a common wound, or ulcer, yet it cannot get into the constitution by the breath, perspiration, milk, &c.

Case.—Gonorrhœal matter was inserted in the prepuce, Sept. 1, 1817, with the point of a lancet, in a similar way to vaccination; on the 4th and 5th the part inflamed and suppurated; the pustule was opened, the contents squeezed out, and a poultice applied twice; the wound was then dressed in as simple a way as possible; and on the 14th it was perfectly healed. Nothing further was done than I have detailed, and yet no secondary syphilis was observed after six months had elapsed.

What does this case prove? Why, that allowing the matter to be gonorrhœal, similar to what is mostly seen, (as there are exceptions to all rules) it was not capable of causing a venereal affection. If gonorrhœal matter be applied to a wound or ulcer, will it produce syphilis? I think not. If the matter of chancre be applied to a scratch, or wound, it will cause every symptom of the disease locally and constitutionally. Will the matter of chancre, inserted into the urethra, cause clap? I think it will produce a discharge. The effect of any irritating body on a secreting surface tends to do so; but ulceration would follow; and those claps that are seen sometimes so inveterate, I imagine to be of this nature. I have reason to believe a clap may be caused by connexion with a woman during the continuance of the catamenia, and I think it might be occasioned by fluor albus also. Women are sometimes so insensible to shame as to set no bounds to their depravity, and allow privileges to our sex which ought to be confined to certain periods only; and from the want of requisite cleanliness, these discharges become extremely acrid and offensive.

LECTURE XXIX.

ON GONORRHŒA.

THIS disease arises from the action of a morbid poison on a secreting surface, and is commonly attended with extensive inflammation. The usual seat of it in men is the urethra; but it sometimes takes place on the prepuce and glans penis: in women, the vagina, urethra, labia, clitoris, nymphæ, the glans, &c. When it attacks the glans and contiguous parts, it commences principally about the root of that body, where the cuticle is thinnest; it occasions soreness and tenderness in the parts, with a secretion of a thin matter: it is often here so slight as not to be much noticed.

CASE.—Mr. B. was connected with a woman in town, and perceiving a running four days afterwards, consulted Mr. Hunter, who, on examining him, found the glans excoriated, and discharging matter, but did not suspect it to be occasioned by impure coitu, till other circumstances set the case clear. It is seldom extended from thence to the urethra. The most probable way the poison attacks the urethra is this, that it is either translated from the glans to it, or, at least, from the beginning, or lips of the urethra itself, along its inner surface. It is not possible to conceive that the matter could be conveyed far into the urethra in the act of coition. The case of Colonel B. strongly corroborates this; he received infection, and had a bad gonorrhœa, from sitting on a necessary in Germany, and getting a plaster of gonorrhœal matter (which some person had left there) on his penis. When it attacks the urethra it seldom extends farther than an inch and a half along the canal.

Symptoms.

The first symptom a patient experiences is a titillation, or itching sensation in the urethra, as if a drop of urine remained in the passage. A small quantity of mucus is discharged on pressure. In twenty-four hours a considerable serous discharge will be found to have taken place; at first, not at all purulent, but in a few hours it assumes this character, having a yellowish appearance, and is composed of a number of globules very similar in its nature to that of pus, with the exception of its being poisonous. The discharge soon changes from a yellow to a greenish colour, and is often mixed with blood; when examined on a cloth it assumes various hues, the circumference pale, and the centre thicker and of a deeper colour, and it is probable that these different tinges depend most commonly upon the extravasation of a small quantity of blood. The matter has a very peculiar smell, and there is a great tendency to putrefaction, in consequence of unhealthy inflammation. During a very high inflammation in the urethra a considerable quantity of blood has been often lost; this proceeds from a rupture of some of the vessels in the passage; it gives relief at the time by checking the inflammation. Sometimes a great deal of coagulable lymph is seen floating in the urine, and this even after the disease has existed for some time. After the first irritation felt by the patient, he has a smarting sensation in voiding his urine, and in a little time this increases to that degree, accompanied with considerable heat of the parts, constituting what is termed *ardor urinæ:* the pain is sometimes so excessive that the patient dreads the thought of voiding his urine, and delays it for several hours: it is however much lessened by discharging it guttatim. The pain felt is owing to a deficiency, or rather, an altered state of the natural mucus, which is secreted for lubricating the urethra during the discharge of urine.

The external appearances are these: the lips of the urethra are observed very red, with a prominent and tense tumefaction, with pain at the frænum: the disease takes two courses, externally and internally. As it advances the whole of the glans penis becomes affected, and is of a florid red colour; a deposition of serum takes place, accompanied with a swelling of the parts, which is productive of phymosis. The absorbents of the dorsum penis become enlarged, and are easily distinguished by the finger being rubbed on the surface: the inflammation extends to the root of the penis, and in bad habits even to the pubis, along the course of these vessels, terminating occasionally in suppuration. The glands in the groin are next enlarged, constituting what is termed a sympathetic bubo, for sympathy, in the strict meaning of the word, applies to an affection taking place in a part remote from the seat of the disease. This enlargement in the groin differs very much from the true venereal bubo. The gonorrhœal inflammation does not subside here, but directs its course more internally, and the patient, flattering himself with the hopes of the disease going off, from the disappearance of the bubo, begins of a sudden to have a peculiar uneasy sensation at the neck of the bladder, owing to the extension of the inflammation along the urethra; spasms may soon be anticipated; a great deal of pain is felt in perineo during walking, below the part first inflamed: the corpus spongiosum next is affected, adhesions take place in it, constituting that most troublesome sensation the chordee, which produces an incurvation of the penis. The lacunæ become soon affected, an obstruction takes place in them, and it frequently happens that an abscess forms, which bursting, the contents are discharged per urethra: it generally occurs near the frænum, but there are instances where they form near the bulb, and in this situation they are dangerous, in consequence of the probability of the contents being effused into the cellular membrane. When the inflammation extends along the urethra, opposite to the acceleratores urinæ, spasmodic contractions are occasioned every four or five minutes, extending to the perineum, and often accompanied with an inflammatory stricture in the urethra, which is easily known by the flow of urine being often suddenly interrupted. When the inflammation extends as far as the membranous part of the urethra, those ducts which open into it take on the disease, as the vasæ deferentiæ, and which, extending along their course to the testicle, produce hernia humoralis, prior to which, however, there is considerable pain felt in perineo.

Treatment.

It was formerly the custom to administer mercury in this complaint, under the idea that it was a similar disease to syphilis; but the notion being now completely refuted, this medicine even as a purgative is unnecessary; and it is much better to depend upon any other medicine to induce this effect.

In the inflammatory stage, a purgative, composed of six grains of cathartic extract, should be given every night, and a powder composed of the sulphate of magnesia two drachms, nitre a scruple, twice daily. The patient should drink plentifully of barley water, mucilage of gum arabic, linseed tea, &c.: the best drink I know of is composed of gum arabic, linseed and nitre, boiled in a quantity of water. He should live very abstemiously, avoiding fermented or spirituous liquors, spices, &c.: the best beverage is soda water. In every stage the bowels must be kept open by mild laxatives; and if the patient be of a plethoric habit, and the symptoms run high, general bleeding will be proper. He might take occasional doses of the aq. kali pur.; and if the pain be great, three grains of the extr. cicutæ bis die: the penis should be emerged frequently in warm water. The carbonate of potass disolved in water, half a drachm for a dose, or the carbonate of soda, which is still preferable, may be occasionally recommended. If there be inflammation on the outer surface of the penis, leeches should be applied, and afterwards warm fomentations, so as to promote the bleeding; afterwards a lotion or poultice of the liquor. acet. plumb. dil.

should be made use of—indeed cloths, wetted with this lotion, are recommended by Mr. Abernethy to be kept to the penis from the commencement.

When these or other means directed to subdue the inflammatory action, are successful, attempts must be made to diminish the discharge by taking internally the bals. copaiba, formed into a mixture with mucilage of gum arabic: it will have the effect of changing the colour of the discharge from yellow to a whitish colour, but acts very slightly in diminishing the quantity of it. By the use of the balsam, the canal is brought into a better state for the use of injections, and therefore it should be given three or four days previous to their use. Astringent injections may then be had recourse to, used weak at first, and increased gradually in strength, as the sulphuric acid, six drops to four ounces of water; this is found not to irritate the urethra: having persisted in its use three or four days, it may be used stronger. The acetate of zinc, six drops to four ounces of water, may then be substituted: this should be warmed previous to its being injected. Injections of lead are not approved of, as they are thought to occasion permanent strictures. Injections of the muriate of mercury should only be had recourse to in those patients who have frequently been affected before with gonorrhœa; it must be used very weak: it is a safe injection, but is very slow in exerting its beneficial effects. A good injection is one made of calomel two drachms, opium one scruple, mucilage of gum arabic four ounces. Injections should be used three or four times daily, besides morning and evening; and also if the patient awake in the night. Syringes with long pipes are improper, being liable to wound the urethra; they should be short and accurately smooth, and rounded at the extremity. At the time of forcing in the injection, the patient should compress the penis about three inches down, in order to prevent the passage of the fluid any further down the urethra. Much benefit may be derived from varying the injection every two or three days; a lotion composed of a different medicine should be substituted, by this means the cure will be much accomplished: as when only one kind is made use of, the urethra becomes accustomed to the stimulus, and loses its intended effect; to overcome this, if it be much and suddenly increased in strength, it will be very apt to cause stricture. If the injections, though varied, do not make a cure when used for some time, it will be prudent to lay them aside, and a bougie should be introduced dipped in the following composition: bals. copaib. one drachm, ol. olivar. opt. three drachms, or smeared with the ung. hydrarg. nitr. very weak: these are found frequently to succeed where injections have failed. I would remark, that the great objection to the bals. copaib. is, that it sometimes occasions eruptions on the skin.

This is the plan I would lay down; but I cannot in justice avoid noticing the contents of a paper, by a Mr. Addington of West Bromwich, to be found in the "Contributions of Medical Knowledge," published by the late Dr. Beddoes of Bristol. He gave a grain and a half of the oxymuriate of mercury, dissolved in half an ounce of rectified spirits of wine, at bed time: for an hour and a half or more, a copious salivation was produced, and his patient spit a quart. Aperient salts are to be taken on the day but one afterwards; and on the evening of that day, the solution, as before, is to be repeated, and the salts the succeeding day but one. Three or four doses thus given, frequently, he assures us, removed a gonorrhœa; and he further states, that hundreds were cured by this plan. Cubebs, which are dried berries resembling pepper, have lately attracted notice in this complaint; but until I hear of something more rational on this subject, I shall suspend my judgment. It is asserted, that these berries have a specific action on the urethra, and that the irritation they cause being greater, it overcomes that set up by the gonorrhœal virus; thus the symptoms will be materially aggravated for a time, and when the medicine is discontinued, they abate and disappear. *How* far this will prove to be the fact, time alone will develop; but in my opinion such expedients are improper where much inflammation exists, or the patient is of an irritable habit.

LECTURE XXX.

ON STRICTURES.

The existence of strictures in the urethra, may be known by the patient frequently experiencing an inclination to void his urine, which is first noticed in consequence of his being disturbed during the night more frequently than usual, in order to discharge the contents of his bladder. The urine passes out in a spiral direction, and this symptom is present long before there is any evident diminution in the size of the stream: the stream itself is next found diminished in volume, and is frequently forked, or divided into two. It also often rises up in passing out of the canal at the glans. As the disease proceeds, the urine will first be expelled in drops, and then in spasmodic gushes—seldom in a continued stream. Patients afflicted with this disease, will often apply for relief on account of an incontinence of urine, which is an effect of the complaint. Sometimes, though very rarely, there is a retention of urine; but this is seldom attendant on permanent stricture, and when it does occur, there is generally some other cause superadded besides the stricture. The urine is mostly of the colour of whey, which denotes the existence of an inflammatory affection of the mucous membrane lining the bladder. Persons who have this complaint, have also, in most instances, a gleety discharge, colouring the linen like semen: if he have been intemperate and irregular in his mode of living, the discharge will be of an opake yellow colour, the inflammation being excessive. *Fistulæ* will frequently arise when the disease exists in several parts, mostly in the perineum, though sometimes at the fore-part of the scrotum. When a bad stricture is present, that part of the urethra, beyond the stricture, becomes enlarged, while the forepart is diminished in size and diameter: the part above dilates, and at length gives way, which allows of the extravasation of the contents of the bladder into the surrounding cellular substance: this, by inducing inflammation, causes the formation of matter, which generally bursts externally, though not always, allowing the urine to pass by the same aperture from the bladder. The disease from stricture, does not confine itself to the urethra alone. When a stricture has existed for some time, the bladder becomes affected and thickened, in consequence of the continued irritation set up in the urethra, inducing an almost constant inflammation, and also from the continued action of the muscular fibres of this viscus, by which they are also increased in their thickness. When disease of the bladder is present, it is denoted by an uneasy sensation in the regio pubis, and a sense of fulness in this part.

On examination after death, the mucous membrane is found to be thickened and streaked with bloody marks, arising from inflammation— it is also œdematous. A secretion of coagulable lymph takes place, which causes the wheyey appearance in the urine. When this symptom makes its appearance, the constitution generally becomes affected with febrile symptoms, similar to an intermittent, consisting of a more or less severe paroxysm, recurring at uncertain intervals, now and then preserving regular distances of time between the fits. When these appearances were present, it was generally the custom to throw in the cinchona; but this practice was attended with little or no success. Opium, with evacuants of different kinds, were found to be effectual remedies; and few cases occur in which this plan will not succeed. From the bladder, the ureters and kidneys become diseased: they enlarge, and ulceration takes place in the ureters, and pelvis of the kidneys. Patients often die of the ultimate effects of stricture; hence stricture is found to be one of the most serious consequences succeeding gonorrhœa; and as it may prove very dangerous, and is seldom completely relieved, practitioners ought to be very cautious not to induce it by the use of injections during the inflammatory stage.

The appearance of the urethra on dissection, when stricture exists, is a thickening of its coats, and a diminution of its diameter at the thickened part. It sometimes appears as if a string had been tied round the outside of the urethra, and the stricture will extend no further than where inflammation, thus induced, would be supposed to extend: occasionally, though less frequently they are met with, resembling the urethra compressed by a broad riband, the contracted part being some space in length; when this latter is the case, they are difficult indeed to remove. A stricture is now and then caused by membranous bands crossing the urethra. There is also another species, termed the elastic stricture; in this, though the common bougie is applied daily, no progress is obtained, as immediately on its being withdrawn, the strictured part regains its former tightness.

Caruncles and warts are sometimes situated in the urethra, but the cases are rare; in one specimen the wart grew from the verumontanum.

Some have imagined that the existence of excrescences in the urethra was only ideal, and handed down from one practitioner to another as probable. Mr. Hunter, however, saw two cases of stricture of long standing, in each of which there was a substance in this canal similar in appearance to polypi, and he considered them a species of internal warts.

SEAT OF STRICTURE.

This is various; but the most general situation is where the original stricture is found about seven inches down the urethra, or rather less, at that part where the membranous portion of the urethra is joined to the corpus spongiosum. It is seldom the case when the disease has existed for some space of time, that one stricture alone is found, there are mostly two or three; one from three and an half to four and an half inches, one at five inches, and another at six and an half or seven inches from the glans. Occasionally there are several existing. Mr. Hunter has seen from five to six in the same person. If the patient have had the disease a long time, the penis is often distorted, and not unfrequently bent to a right angle, which arises from inflammation in the corpus spongiosum from the irritation induced by the stricture. Strictures are slow in forming, and are worse in cold weather.

CAUSE OF STRICTURE.

The primary causes are various; but the *proximate are always inflammation of the membrane lining the canal.* The most frequent occurrence is inflammation subsequent to gonorrhœa, whether arising from the violence of the disease itself, or brought on by the use of injections during the inflammatory stage. Riding on horseback during the period of cure, as well as drinking spirituous liquors, will equally tend to produce such an effect. Other causes will induce the disease, independent of any taint whatever, as is proved by the existence of it in children, though it certainly is a rare occurrence in them. Mr. Hunter believed, that strictures seldom arose from the venereal disease in any shape, and he says it will be difficult to open people's eyes on this subject, there being but few persons now-a-days that have not, some time or other, had a gonorrhœa!! He founded his opinion for supposing strictures not a consequence of gonorrhœa, on these grounds, that the œsophagus, rectum, ductus ad nasum, and parts of the intestines, &c., are occasionally the subject of the same disease; another reason was, his having patients with stricture who never had a gonorrhœa; and further, a gentleman, a patient of his, suffered with one, who had not had a gonorrhœa for between thirty and forty years: again he says the most common seat of it, is the membranous and bulbous parts of the urethra; the principal focus of the gonorrhœal inflammation is directed to the lacunæ; that, he maintains, is the head-quarters of it. Strictures, he says, never arise during gonorrhœal inflammation, and patients have come to him labouring under strictures, who never employed any injections, though these are considered almost the invariable cause by some surgeons. A bougie is more severe than an injection in its introduction, and yet they are never blamed.

Strictures are sometimes rendered worse by a small stone passing along the urethra as far as the diseased part, and lodging there. Strictures are at times considered the cause of stones forming in the bladder, and this seems to depend upon the retention of urine.

TREATMENT OF PERMANENT STRICTURE.

This disease is so very obstinate, that scarcely a single patient is ultimately cured: those who have been once affected with it, retain such a disposition to a re-attack of the disease, that a very slight cause will induce its re-appearance. It certainly is often relieved, but rarely permanently cured, though many cases have been published that would lead a medical man to suppose such an assertion not well founded; but long use to the perusal of cases detailed with interested views, have rendered some surgeons sceptical.

The first step in the effort to cure, is to introduce a bougie, composed of soft wax, into the urethra, to ascertain the situation, nature, form and size of the stricture; and the surgeon will then be enabled to judge of the kind of bougie required. The stricture is more commonly situated at the upper part of the canal. When the particular bougie is determined on, it must be bent similar to a catheter, and introduced in the same manner, well oiled. When a bougie can be passed into the bladder, one of the largest size must be used each time of passing it, until the canal has regained its original size: this being done, the patient should be instructed how to use and pass it himself, and he should be advised to introduce it into the bladder every two or three weeks, otherwise the stricture will be apt to return as bad as ever. The metallic bougies are not so good as the wax ones; they give more pain, and do not adapt themselves to the form of the urethra as well as those made of wax: besides the latter seldom produce hæmorrhage from the canal by passing through or injuring its coats, as they will bend when impelled against the sides: such an accident, as injuring the membrane, will often lay the foundation of future strictures. A catheter may be introduced into the bladder when a bougie cannot, and it is always better to attempt the introduction of it, previous to using the caustic bougie. The catgut bougie is not a good one, though it may be of use to dilate the strictured part when the opening is very small. It will be right to increase the size of the bougie, in such cases, almost daily, until the passage is restored. Supposing that neither a bougie or catheter, however small in size, can be introduced, recourse must be had to the caustic one. In making use of it, take one of a good size, as large as the urethra will admit of, and I think those charged with the nitrate of silver are the best: the kali purum irritates the urethra more than the former; besides it dissolves more readily, and will be much more liable to induce inflammation around the stricture: the nitrate of silver being less soluble, will have its effects confined more to the strictured part. Prior to using the armed bougie a common one should be passed, to ascertain exactly the seat of the disease, and also to dilate the passage; it should be larger than the caustic one, and the distance on the latter must be marked, so that it may be known when it has reached the stricture. The caustic bougie must be passed as quickly as possible, and then suffered to remain in the urethra a longer or shorter time, according to the irritability of the patient, and according to the frequency of using it: half a minute every other or second day, will be enough at first, allowing the slough to separate on the intervening days: it has succeeded in removing the stricture after a few applications. Several cases could be detailed, proving, beyond a doubt, its utility. Other instances could be given where it produced very distressing symptoms, such as retention of urine, &c.; to prevent which, it is extremely necessary to be cautious in the first introduction, the suppression being caused by the great degree of irritability induced in the urethra. It has happened that the artery of the bulb has been destroyed by its use, and thus an alarming hæmorrhage took place, and ultimately the formation of a spurious aneurism. From its having been used improperly or incautiously, false passages have been made, which are always troublesome, and not totally unattended with danger. Such are the disadvantages of the caustic bougie, which, I may remark, are principally to be attributed to the mode of applying it; although, on the other hand, I must candidly confess, even in the hands of the most skilful men, it has frequently failed. The cure must be effected either by dilatation of the contraction or destruction of it. To whom is the profession indebted for this last plan of treating strictures? To Mr. Hunter. His ideas were too original to be a copyist. He began with red precipitate. Sir Everard Home has written a very excellent work on strictures, advocating the plan of Hunter. Mr. Whately has favoured the world with a new method of treating strictures; it is on the same principle, so that there is no novelty in this respect; he prefers the kali purum.

ON FISTULA IN PERINEO.

It has its origin from an enlargement of one of the lacunæ, in consequence of inflammation, resulting from the application of the matter of gonorrhœa to that part of the urethra, in its extension downwards towards the neck of the bladder, causing a stricture. It is variously situated as well as formed; being sometimes found in perineo, at other times further back, forming a communication between the urethra and rectum. It is most frequently arising from strictures: the internal membrane inflames and ulcerates, urine readily extravasates into the loose cellular membrane, not only of the penis, but also of the scrotum; hence suppuration soon commences, and ultimately affects this fistula. Sometimes a fistula is thus formed very suddenly, but in general gradually.

The patient observes a very hard and distinct tumour existing in that part of the urethra opposite to the bulb, not in general exciting much pain, but causing a good deal immediately the contents of the bladder are evacuated. The urine being extravasated here, occasions inflammation and subsequent suppuration. When this takes place very suddenly, the life of the patient is in great danger, from the extravasation of urine into the cellular substance of the perineum or scrotum; in such cases the inflammation and suppuration are violent and extensive, spreading not only to the scrotum, but to the integuments, at the anterior and inferior parts of the abdomen. In cases of this nature, it is right to make an opening into the part as soon as possible. An attempt to check the formation of matter is only so much loss of time, as they are never attended with success. Early opening of the abscess is highly necessary here, and more particularly when the urethra bursts suddenly: if it be neglected, patients will, in all probability, fall a sacrifice.

The *mode of operating* is thus: pass a catheter as far as the stricture will allow, then make an incision an inch beyond it; after which pass a staff into the urethra, and cut directly upon it through the stricture; by this means present relief is not only afforded, but it may effectually relieve the stricture, introducing an elastic hollow bougie, and suffering it to remain two or three days. The scrotum should always be opened at different parts by means of incisions, made sufficiently deep to admit of the urine being evacuated by means of them, but not so as to endanger the wounding of the tunica vaginalis: by this method, and by this only, will sloughing be prevented. The application of a vinegar poultice to the scrotum, will be found extremely beneficial. Whether the extravasation is anterior to the scrotum, in it, or in the perineum, the early opening is always to be adopted. Having made the necessary incisions, the surgeon's next attention must be directed to the stricture, as while it remains in its original state the fistula can never be cured. For this purpose practitioners employ the bougie, and the caustic is far preferable to the common one. It sometimes happens, that the stricture shall be entirely removed, and yet it is found impracticable to heal the fistula: under such circumstances the flexible metallic catheter should remain in the bladder, and the patient be directed to lie as much as possible in an horizontal position. The catheter should not be suffered to remain any great length of time in the bladder, as the urine will act upon the metal so as to corrode and break it, and instances are on record when it was requisite to perform an operation for the removal of portions of the catheter thus confined in the bladder. It is better, therefore, to suffer it to remain in the bladder only a certain length of time, then remove it, and introduce another: three or four days will be the best space. If the fistula do not heal under this treatment, applications to the part may be useful, such as a gentle solution of the hydrarg. muriat. thrown up the fistula by means of a syringe. A case happened where the abscess burst and formed a connexion between the urethra and rectum; here the plan to be adopted must consist in removing the stricture, and the constant introduction of a catheter, or else an operation must be attempted similar to lithotomy, at the commencement, and for a time form a fistula in perineo. The grand intention to be kept in view in treating fistula in perineo, is to restore the passage of the urethra; when this fails, the sinuses must be laid open.

SPASMODIC STRICTURES.

This species of stricture is rarely found unconnected with the permanent one. It may be known by its being only of a temporary duration; it is generally attended with a gleet. The patient is not conscious of any disease of the kind: feeling a more frequent inclination to void his urine than usual, and being foiled in the attempt, is the first thing that strikes his attention; it is for the most part unattended with pain. It is caused, when connected with permanent stricture, by the free use of injections of a stimulating kind, and the plentiful administration of opium: at other times by the frequent and copious use of spirituous liquors, riding much on horseback, &c. At the contracted part a spasmodic action is induced. Even a difference in the temperature has great influence in the facility of voiding the urine, hence, a person going out of a warm room into the street, will not be able to pass a drop of urine, but on returning, after a little time has elapsed, he will make water readily.

Treatment.

First attempt to pass a bougie, but in a very gentle and cautious manner, so as not in the least to irritate the penis: when it has passed as far as the stricture, do not attempt to push it beyond this point by any means, but preserve a gentle and uniform pressure for the space of five or ten minutes, waiting for the absence of the spasm: by these means the surgeon will generally succeed in passing the bougie into the bladder. If the patient be desired to force gently, on withdrawing the bougie, the urine will mostly follow in a moderate stream. If, however, this treatment fail, antimony, combined with a very small dose of opium, or administered alone in small quantities, frequently repeated, so as to induce nausea, should be ordered. Tobacco glisters will also be found serviceable, so as to produce general relaxation. Ten drops of the muriated tincture of iron every five or ten minutes, has been of the most decided benefit, and Mr. Cline most strongly recommends it in the spasmodic stricture. Mr. Else had a case, which was relieved from time to time by lime water. Another person was cured by means of the cold bath, when every thing else had failed. The author has known a gentleman, who was subject to this stricture, materially relieved by emerging the penis only in cold water; in fact, he could not void his urine for some time, till he adopted this practice. The warm bath has occasionally been recommended, and considered very useful, but this practice appears to have been pursued by confounding the spasmodic with the inflammatory stricture.

THE INFLAMMATORY STRICTURE,

Is caused by the extension of gonorrhœal inflammation towards the bladder. It is accompanied with great irritation and pain of the accelerator urinæ muscles. This pain will come on very violent, and continue so for the space of two or three minutes; it will then cease for five or six minutes, when it will again recur with equal violence. This complaint will continue thus to torment the patient some time. The inflammatory action set up causes a retention of urine. Stimulating medicines given to act as diuretics in gonorrhœa are often the cause; virulent gonorrhœas, as well as the irritation of strictures, tend to this effect. Cantharides affect the neck of the bladder by their stimulus, and produce a strangury.

Treatment.

Bleeding largely from the arm, the application of leeches to the perineum, and emerging the patient in the hot-bath, or in a vessel invented for this purpose, called the hip-bath, must be had recourse to; sponging the parts continually with tepid water will give relief. The mustard poultice applied to the abdomen is useful, from the rubefacient property it possesses, and is better than the empl. lyttæ, on account of its not stimulating the urethra or bladder. A pill composed of submuriate of mercury, gr. iss.; powder of opium, gr. j.; extract of hemlock, gr. ij.; camphor, gr. iij.; made into a bolus, with some conserve, has a very good effect. If these means fail in affording relief (but they seldom will), the catheter must be cautiously introduced, and the collected urine evacuated. If this be found impracticable, and there be evident marks of distention of the bladder, the operation must be performed without delay. When it has arrived at the chronic state, small doses of the hydrarg. muriat. with decoct. sarsaparill. are beneficial. I would remark, it is better not to attempt the introduction of any instrument, till the body, at all events, has been a good deal relaxed by the bleeding, hot-bath, &c. This complaint is almost, if not entirely, confined to irritable habits.

ENLARGEMENT OF THE PROSTATE GLAND.

This is a disease attributable also to gonorrhœa in some instances. It occurs frequently in elderly people after the age of sixty. It causes retention of urine, in consequence of the posterior lobe of the prostate being so enlarged as to act as a valve upon the urinary canal. The gland becomes inflamed, and this is mostly succeeded by suppuration. The prostate of old people is naturally enlarged, particularly when the urethra has been very much excited. It happens to be a provision of nature, to prevent an incontinence of urine, which would otherwise often be the case, as the muscles lose their tone to such a degree as almost to have lost their powers of action. It is frequently found enlarged in three different parts. The urethra within it is also so much dilated, that a surgeon is liable to be deceived in passing the catheter, supposing he has entered the bladder, when in fact the instrument remains still in the urethra. The symptoms of an enlarged prostate are in many respects similar to those of the stone; instead, however, of feeling a sharp pain at the extremity of the penis, it is only a sense of numbness: great tension in the regio pubis on discharging the urine, which passes off in sudden gushes, requiring considerable force to void small quantities of it: there is a sense of weight in the perineum, and sharp pain in the neck of the bladder when voiding fæces; next, the patient is incapable of making water without going to stool. The desire to evacuate the urine is greater in a recumbent than in an erect position of the body. A total retention is the consequence, which is more particularly distressing in the night, arising from a great accumulation of urine at this time. When the urine is drawn off, it is of chocolate colour, and peculiarly fœtid. The reason why a retention is greater in the morning before the patient rises, than it is at another time, is, that the third, or posterior lobe of the gland, is at that time acting as a valve upon the opening into the urethra, in consequence of the pressure of the accumulated urine behind it.

The existence of the complaint may very generally be ascertained by an examination of the part per anum. Though it is also a disease which may, in most cases, be considered as peculiar to old persons, yet there are instances of its having occurred not only in the prime of life, but also in a boy.

Treatment.

The balsam of copaiva is to be ranked as one of the most effectual remedies, giving twenty drops thrice daily. The uva ursi has been much recommended, but it cannot be held in the same estimation as the preceding medicine. Soda water, or in its stead a solution of soda, has been found very beneficial. The only remedy known to give permanent relief is the hydrarg. muriat. in solution, accompanied by the sweet spirit of nitre. The hip-bath is useful. In the treatment of diseases of the urethra not a little depends upon an accurate knowledge of their symptoms and the anatomy of the parts. When the urine requires to be drawn off in a case of enlarged prostate, a catheter is necessary two inches longer than usual; its extremity should also be enlarged: it should be passed down to the prostate, then depressing the handle so as to raise the other end above the posterior enlargement, will generally prove successful. Having introduced it for two or three days, the prostate will put on a healthy appearance, and the inflammation will subside, provided the affection is *only recent*, and proper attention be paid to the antiphlogistic plan of treatment, &c. It will be proper to let an instrument remain in the bladder; for this purpose Smith's hollow elastic bougie will be best; but it should not remain in the bladder long without being withdrawn and cleansed—not exceeding five or six days at all events.

LECTURE XXXI.

THE EFFECTS OF GONORRHŒA ON THE BLADDER.

The bladder is occasionally getting into an *irritable state*, which mostly proceeds from the use of very powerful injections during the inflammatory stage of gonorrhœa. It sometimes denotes the existence of a stricture in the canal. Now and then it is attended with the symptoms of stone in the bladder, and these are so similarly marked, that it is difficult to discriminate one from the other.

The *symptoms* of an *irritable* bladder are, a frequent inclination to void urine in the day time, probably every three or four minutes, and six or seven times in the course of the night. As soon as the bladder is a little distended with urine, there will be a strong propensity to discharge it, and any attempt made to retain and overcome this troublesome desire is attended with an excruciating pain in the regio pubis. There is also a considerable quantity of mucus discharged along with the urine, which is often tinged with blood. The bladder occasionally becomes inflamed, and contracts adhesions to the abdominal muscles, and if the patient be of a delicate habit of body he is very much curved forward. The passing of any instrument into the bladder occasions symptoms the most distressing, nor do the sufferings in this case abate for a considerable time. It had the effect of exaggerating the distress so much in a case of this kind in a young gentleman, that most of the subsequent danger was attributed entirely to this cause. The disease, in the first instance, arose in consequence of his retaining his urine too long, through motives of delicacy.

The *distinguishing* character between this complaint and stone in the bladder, is, that when the bladder is empty, the patient is so free from pain and uneasiness that he can bear to leap or put himself into any position, without suffering inconvenience; but if he exert himself, however so trifling, when the bladder is full, he experiences very great pain. The sudden stop put to the flow of urine in this complaint, is not similar in its cause to that which exists when a calculus is in the bladder, being, in the former case, caused by his own efforts from the excessive pain he suffers. There is generally a great deal of tenesmus and bearing down of the rectum in this complaint. Upon dissection it has been found, that the mucous membrane of the bladder has been highly inflamed, and in a fungous state, having a very striking resemblance to an eye affected with Egyptian ophthalmia: the bladder is much contracted in size, and does not generally contain more than two ounces of urine if the disease be much advanced, nor more than half a pint in its earlier stage.

If this disease arise from a stricture in the urethra, the first object must be to get rid of it, by means of the caustic bougie: and the use of it, under these circumstances, rather tends to lessen than increase the irritable state of the bladder: but if the disease should remain after the stricture has been destroyed, and depends upon any other cause, the injection into the bladder of a lotion composed of the tinct. opii one drachm; mucilag. g. acaciæ one ounce; or the extract. opii, united with four ounces of mucilage, will be found to have a good effect: the mode of throwing this into the bladder, with the greatest facility, is to introduce a hollow bougie into that viscus, and then with a common syringe throw it up. When there is no bougie to be obtained to convey the fluid, it must be passed forward after injection with a syringe, by rubbing down the canal of the urethra, taking care that the aperture at the extremity of the penis is closed, and also that the liquid must be forced along the passage very gently. This plan has been known to give palliative relief, when every thing else had failed. Opium introduced into the rectum in the form of a pill, combined with hemlock, will also sometimes afford relief; as this can be done without much trouble, it should be adopted in the early stage. The liquor of potass with tincture of opium is found to be of very essential service; but, generally speaking, all the means that can be adopted are only productive of temporary relief, unless the irritation is subdued in the first instance. The irritability of the bladder will now and then go on to suppuration, and this leads to a communication between it and the rectum: when this happens it may be ascertained by a considerable portion of lymph, in pieces about the size of a shilling, folded up, passing off by the urethra; also there will be a quantity of blood mixed with mucus, coming away. The urine has a very fœtid smell, similar to the fæces; the patient loses his strength; in a short time purging comes on, which soon terminates his existence. The most deplorable case the author ever witnessed, was where a communication was formed between the bladder and rectum: it healed for a short time, and there were great hopes entertained of recovery; but from some exertion or other, unnecessarily made, the newly formed substance gave way: and it soon ended fatally.

Treatment.

Independent of the injection of opium, the patient should drink plentifully of mucilaginous drink and soda water, especially in the first stage. When ulceration has occurred, introduce an elastic catheter into the bladder, so that the urine may continually dribble away, thus keeping the bladder completely empty, which allows the lips or edges of the ulcer to come into contact, and an opportunity is given them to unite, which by a contrary plan would be prevented. The two principles to be held in view, are, to keep the rectum clear, by the frequent use of cooling laxative glisters; and the bladder free from urine, by means of the elastic bougie. The administration of the bals. copaib., or the aq. kali pur., combined with opium, constitutes the medical treatment. The plan laid down by Dr. Cheston was a powder composed of the pulv. tragacanth. comp. and the sodæ carbon. taken several times daily; and the following mixture, at intervals between each powder: ℞. Tinct. benz. comp. ℥ij.; vitel. ovi, q. s. decoct. hordei, lbss.; ft. mistura.

The bladder sometimes *ulcerates anteriorly*, in consequence of stricture. The plan of treatment to be pursued will be to destroy the stricture, and when it is accomplished, introduce a hollow bougie into the bladder, so as to allow the urine to drain off continually. The edges of the wound are then to be touched occasionally with caustic, in order to induce union.

There is a PARALYTIC affection, which sometimes, though rarely, supervenes gonorrhœa, and affects the bladder alone. This disease generally attacks old people. It may be known by two circumstances; when the bladder is completely distended with urine, there is not any pain or fever present, and when a catheter is passed into the bladder in this state, not a drop will pass off if the patient be in a recumbent posture, but immediately on his elevating himself, the urine will flow off in a full stream, owing to the pressure of the abdominal muscles and viscera, which force the urine downwards. A blister sometimes will have a good effect in these cases. Turpentine glisters, tonic medicines, and cold bathing, will contribute to restoration.

Diseases of the kidneys, which go on to ulceration, generally end in the death of the patient.

Bleeding from the *urethra*, during the acute stage of gonorrhœa, is generally an alarming circumstance to the patient, though the result is ultimately beneficial. In order to check hæmorrhage, pressure made upon various parts of the canal, for the space of five or ten minutes, will generally be sufficient. Sometimes it will require that the whole of the penis should be pressed with a roller, or a T bandage, secured on the perineum. The introduction of bougies, under these circumstances, into the urethra, is the very worst thing that can be done, as they open the mouths of the bleeding vessels. It will be right to give purgatives, such as the sulphate of magnesia in the infusion of roses.

Chordee.—This is a very troublesome symptom, though not an alarming one. The cause of it is an effusion of coagulable lymph into the cells of the corpus spongiosum, by which they are glued together, so as not to allow of distention by the blood, whilst that side of the penis unaffected is filled with it; this causes the pain which the patient experiences. Leeches to the penis, fomentations, &c. will generally relieve; but in order to get temporary ease, a bottle of cold water held between the thighs, bathing the parts with cold water, or the saturnine lotion, will be useful. The medicines to be administered internally are calomel with opium, or cicuta, in full doses. Opium is the one principally to be depended on; but as it is apt to cause costiveness, an alterative combined with it, is required.

For the hardness which remains, after the inflammatory and most urgent symptoms are relieved, the best application will be the mercurial ointment with camphor.

There is, sometimes, in gonorrhœa, an inflammation of the *lacunæ*, so as to induce the formation of *small tumours* about the *size of peas*, on the under side of the urethra and corpus spongiosum; one of them opposite the frænum often suppurates, and the urine will take its course occasionally through the opening, by which the matter has made its exit externally. Abscesses have thus formed behind the scrotum, and in one of these cases the patient died, whose habit of body was excessively irritable. In general, as soon as the existence of matter can be known, they should be opened with the point of a lancet, and if a sinus form, in order to destroy it, and afford an opportunity of healing, a piece of the lunar caustic, made very pointed, should be occasionally introduced into it, taking care to avoid injuring the urethra.

Not unfrequently there are several glands in the groin inflamed and enlarged, forming the sympathetic buboes; these do not require the exhibition of mercury, as in a venereal enlargement. They are to be treated as if proceeding from a common inflammatory affection: by leeches, in some cases, in others, merely the liquor. ammon. acet.; or the saturnine wash, applied on the part, and the exhibition of purgative medicines, will be adequate to their removal: if mercury be made use of, they will certainly suppurate.

Abscesses will occasionally form along the *absorbent vessels* on the dorsum penis; no mercury is necessary for their cure; they require to be opened early.

ON IMPOTENCE, OR SEMINAL WEAKNESS.

The disease thus named, consists in a discharge of mucus, or something resembling it, from the urethra *after* the urine has been evacuated more particularly; and at being at stool, especially if the patient be costive. It is not semen, as some have supposed, but the fluid contained in the vesiculæ seminales: this has been proved by experiments. Old men are generally the subjects of it, and it is often supposed to arise from a venereal cause invariably, which cannot be easily determined, although Mr. Hunter was disposed not to think so. Patients labouring under this disease, are generally more affected in mind, being hypochondriacal, than in body, and suppose the discharge will drain them to death. It may be observed, that every organ of the human body, without exception, is made up of different parts, so formed as to produce a succesion of actions and ultimate effects; and if any irregularity in these actions take place, it is what constitutes disease. The parts subservient to generation in man are two; one immediate, which is the testes, the other secondary, which is the penis. It sometimes happens that the penis is too forward, becoming erect before the testicles are subservient; and on the contrary the testes will throw out the semen before the penis is erect.

Of the first, or priapism.—This is an erection of the penis without the mind or testes corresponding, and a violent gonorrhœa will produce it: the sensation is a pain arising from an inflammation of parts. The *spontaneous* priapism is a very dangerous disease, and should be treated with powerful tonics, &c.; that arising from an inflammatory affection, generally gives way to the evacuating treatment, and the administration of opium.

The second cause is more common than the former, and what is generally seen in practice. It is an irritability of the vesiculæ seminales, and perhaps of the vasa deferentia, which is evinced by this: a man going to be connected with a woman, the moment his organs come in contact with her's, an emission takes place, and all inclination ceases. There are some men, who, by seeing women, or conversing with them, have emissions. Very slight causes or impressions on the mind cause these nocturnally. Once a week, or every ten days, a man in perfect health might be thus troubled. It arises from general weakness, and is too frequently the result of a depraved imagination and libidinous ideas. If it were confined to debility, arising from disease, it would be all very well; but youth are found to contract these habits from one another, at public schools and seminaries; excited and allured by momentary pleasure, and unconscious of the melancholy consequences, the practice is pursued with unremitted ardour; it soon becomes habitual, is constantly reiterated, till they at length become, in a mortifying degree, conscious of their folly and wickedness, by a ruination both of body and mind. Independent of the great and innumerable miseries and inconveniences to which the unhappy individuals are reduced, it becomes moreover a matter of public concern. It strikes at the very root of generation itself, and deprives the world of many valuable members of society, who might have lived a glory to their country, and a credit to themselves. If youth, from levity and inadvertence, and perhaps from a kind of modesty, be the dupes for the most part, what can be said of those in more advanced years, who practise it from abandoned, but, in their own opinion, more politic considerations! In this wicked age, when there is unbounded communication between both sexes, and modesty has become a mere nominal existence, the universal prevalence of this pernicious practice is truly surprising. If it were confined to the male part of the creation it would be the less excusable, but I am truly sorry to declare, that the fair are no less criminal in this respect, to the great prejudice of their health and native beauty.

The other causes are, excessive venery, severe evacuations, which cause great debility in the system. In some persons it may be occasioned by a want of confidence in his capabilities at the time of connexion.

In the treatment, the profuse and unseasonable discharge of semen, which occasions a state of great debility, must be discontinued, or prevented; and those medicines which communicate strength and vigour to the system, freely given, and chiefly depended on, combined with the cold bath, and local bathings for the re-establishment of health. Mr. Hunter advised a young man who had an evacuation every night, and frequently when he walked or rode on horseback, to take twenty drops of laudanum at bed-time, which afforded relief, when bark and other remedies had failed, and by continuing its use he perfectly recovered. An elastic yoke, put on the penis to bind it to the thigh, will be of service, or a piece of thin metal to retain it in that situation, which will occasion some pain if erection take place, and awake the patient. If it arise, as it frequently does in old people, from an affection of the mind, two instances of which I have known in men of property and respectability, married to as fine and handsome women as could be seen, which I attributed to a consciousness of incapability, as there was a considerable disparity in years, make light of their complaint; but, at the same time, assure them of a certainty of cure, or at least of getting better, and prescribe pills composed of any inert substance, desiring them to be careful to take one only at night, and by no means have any connexion with their wives: and it is seldom that more than half a dozen are swallowed before a good account is given by the patient of their surprising efficacy. Mr. Hunter recommended a patient who was complaining of impotence to sleep with a female, but forbad him to have any connexion with her for several nights. In this case the disease being merely a mental affection, he was completely relieved by pursuing the plan for only a night or two, as nature was found to be ever vigorous.

One of the testicles may be lost without producing any very perceptible effect upon the virile powers, though both of course will entirely destroy it. A curious case illustrative of this, occurred in Guy's Hospital some years ago.

Abscesses of the *epididymis*, which supervene on inflammation of the testes, will very much, though not entirely, abolish the power.

INFLAMMATION OF THE TESTES.

Inflammation of the testes arising from gonorrhœa, has been absurdly termed HERNIA HUMORALIS by most authors; why, or wherefore, may rationally admit of a volume of controversy. The symptoms which denote the approach of this affection, are, a sense of irritation towards the interior termination of the urethra; as the gonorrhœal inflammation proceeds down the canal, and arrives at the perineum, there is a sensation felt as if a drop or two of urine lay at that part, which causes the uneasiness felt there; almost immediately on the last symptom being perceived, the testicle begins to be affected: there are shooting pains felt along the course of the spermatic chord, about the abdominal ring: the inflammation passes down to the epididymis, and fixes there: it is this part that is chiefly affected. When the inflammation in the epididymis has arisen to a considerable height, the body of the testes inflames, and becomes much swollen, hard to the touch, and very painful on pressure: the pain extends to the crista of the ilium on that side, and also to the groin. The structure of the scrotum is redder than usual, and touching it occasions pain; and if the testicle hang down and be not supported, it is very much increased. Sometimes there is much constitutional irritation, but this depends upon the habit of body of the patient.

The disease originates from the inflammation extending along the vas deferens to the epididymis, along its mucous membrane. I am not of the general opinion, that it is caused by a sympathetic affection. Any circumstances occurring to cause irritation at the termination posteriorly of the urethra, will have the effect of exciting the disease. Thus, powerful injections, walking to great distances, or riding during the inflammatory stage of gonorrhœa; drinking freely of vinous or spirituous liquors; passing a bougie into the bladder in irritable habits, will induce it, by touching the orifice of the vesiculæ seminales; strictures independent of injections, or bougies, will bring it on; therefore this last being known, if no other cause be evident, ought to raise a suspicion of its inducing the disease. As this disease is so liable to happen from gonorrhœa, it will be as well always to desire patients to support their testicles by means of a bag-truss, made of silk netting. Even when passing or using bougies for the cure of strictures, it will be advisable that patients should keep their testes supported.

Treatment.

It will consist in the suspension of the testicles, the liquor. ammon. acet. applied by means of linen cloths to the part, and the administration of purgatives; as calomel with the cathartic extract, or calomel at night, and the sulphate of magnesia the following morning. If the inflammation should not be removed by the perseverance in this method, a leech or two should be applied to the testes every morning, and afterwards warm fomentations and a poultice; the patient must keep in a recumbent posture. Should these means fail, and the inflammation still continue violent, general bleeding from the arm must be adopted in addition, the number of leeches increased, and the reclining position strictly attended to: fomentations must be frequently employed. It will occasionally be requisite to repeat the general bleedings twice or thrice.

If a hardness should remain in the epididymis after the inflammation has abated, fomentations of vinegar, as warm as the patient can bear, will be serviceable: if it should be obstinate, the mercurial ointment with camphor must be rubbed on, and small doses of calomel and antimony given internally, either alone or combined with cicuta. When the hardness gets into an indolent state, the patient will frequently get tired of these remedies, and a bag, made to fit the testes, of oiled silk, may be substituted: it acts similar to a poultice, by inducing a great flow of perspirable matter; and in effecting the reduction of the enlargement, it will be far preferable to any plaster, and will be of the most decided service; indeed, when applied to tumours of an indolent nature in any part of the body, it is of singular advantage.

Patients will often express some anxiety to know whether this hardness (which will often continue during life) will occasion any diminution in their procreative powers. If the epididymis on both sides be enlarged and hardened, it will have the effect of lessening the secretion of semen, though to what extent has not been satisfactorily explained: if one side alone be hardened, there will be some difference, but not to any manifest extent.

Sometimes the induration of the epididymis will proceed to suppurate and ulcerate, causing sinuses difficult to heal, on account of the semen being discharged through them; these sinuses are similar to a wound of the salivary gland, and equally, if not more difficult to cure. A lotion, composed of six drops of the sulphuric acid to four ounces of water, applied to the part on linen cloths, and injected into the wound by means of a syringe, often will be proper. The sulphate of zinc and copper in solution are good applications. When the epididymis has suppurated, the virile power is much diminished: if both, it is nearly lost. It is only in scrophulous habits that the epididymis thus suppurates.

Persons who have once had inflamed testicles, are very liable to a return of the complaint, on a second attack of gonorrhœa; therefore when this latter disease is again contracted, it is always much better to cure it by purgatives, and the antiphlogistic plan, never using injections of any kind, although the case may be a longer time in being restored than if injections were had recourse to.

EXTERNAL GONORRHŒA.

It is a rare occurrence that gonorrhœa is seen externally: the glandulæ odoriferæ, surrounding the corona glandis, is the seat of it. Phymosis always accompanies the disease, attended with much inflammation, and great discharge from under the prepuce, mixed with blood: the glans and prepuce are considerably swelled. The black wash made of lime water and calomel, and a small quantity of the tincture of opium, is the best application; or the acetate of lead and opium. These lotions should be injected under the pressure, as well as applied constantly to the parts by means of linen cloth: it will generally subside in six or seven days. The parts must be kept very clean, and a purgative medicine taken every other morning.

There are some cases of gonorrhœa, I am told, which have the effect of producing an attack of rheumatism, or of ophthalmia. If injections are used, the symptoms are greatly aggravated; but if the discharge be allowed to be secreted or promoted by the use of emollients, the general disease, if it may be so called, will be much relieved in its violence. To effect a cure of this secondary complaint is considered, by some practitioners, as rather a difficult matter, and the best mode of treatment they advise, is the use of the warm bath every day, local fomentations, and the balsam copaiva exhibited internally; and, under these circumstances, surgeons, they think, ought never to use any injection, but trust the cure to our old assistant and doctress, dame Nature, who might be more tedious, but not less effectual.

The author thinks the first complaint originates from the frequent exposure of some gonorrhœal patients to cold, stripping almost naked to foment, poultice, inject, &c. I know, at this moment, a gentleman suffering rheumatic pains from this cause, lately afflicted with the previous affection. I knew another, a little while ago, with ophthalmia; and from whence did it proceed? why, most assuredly, from want of cleanliness, transferring the gonorrhœal matter from the lower to a more elevated and conspicuous situation; soap and water is the best preventive of the last, and a stout Welsh flannel wrapper of the first.

ON GONORRHŒA IN THE FEMALE.

It commences its ravages in the female sex with an inflammation of the nymphæ; the next attack is at the os externum, or labia vagina; then the meatus urinarius participates and becomes one of the principal seats of the disease; it begins at the orifice, and afterwards extends along the membrane lining it, and the lacunæ, situated in the canal, inflame: owing to the shortness of the urethra, in comparison with that of men, the disease is much sooner communicated to the bladder than in our own sex. Women suffer excessively in the first stage of gonorrhœa, by a violent bearing down of the bladder and rectum, more particularly experienced in the former immediately on having discharged the urine. They are also almost always subject to sympathetic bubo.

The Treatment

Consists in the exhibition of purgatives of the same kind as in the male, but rather smaller doses, as the habit of body in females is much more delicate. Diluent drinks of various kinds are to be given until the inflammatory stage is over, when the use of injections, of the same composition as in the male, but stronger, may be had recourse to: not to be used as injections are generally recommended, but merely as a wash, applied by means of folded linen. When the discharge is great, and the more interior parts are affected, it will perhaps be a better plan to introduce a piece of sponge into the vagina, dipped in the lotion, and allow it to remain there. One of the best lotions is composed of half a drachm of alum to a pint of decoction of cinchona or oak bark; it ought not to be used at the commencement, but rather when the parts get much relaxed from the continuance of the disease.

Women, being subject to fluor albus, makes it sometimes absolutely impossible to distinguish between it and gonorrhœa: the appearance of the matter throws no light on the nature of the disease, the quantity of discharge, as well as the sight of the parts, being much the same. In forming an opinion, therefore, it should be taken into consideration, whether the woman has been connected with a suspicious man, her character and respectability, and whether she is capable of communicating the infection to others. It is clear a woman may labour under this complaint without knowing it, as it will continue for years in the vagina without extending further, or wearied out as in men. A man, Mr. Hunter says, may be connected with a woman, and contract the disease, even without the woman being diseased, for the gonorrhœal matter may only have been deposited on the parts of a woman by the last person connected with her.

Mr. Hunter met with a very remarkable case in a gentleman: he was attacked with rigors, slow fever, restlessness, &c. several weeks before the discharge appeared, and this case shews that the disease cannot be communicated but by matter, for he had connexion with his wife before the running appeared, and was very much afraid he had given the disease to her: this, however, did not prove to be the case. Many of the gonorrhœas met with by men in practice, Mr. Hunter thought were occasioned by the fluor albus, which is sometimes extremely acrid, and by stimulating the parts, might produce a discharge from the urethra.

Young girls, from two to twelve or fourteen years of age, are not unfrequently attacked with a discharge from the organs of generation, similar in every respect to that resulting from the poison of gonorrhœa: it proceeds from the glands between the prepuce and clitoris, and is of a scrophulous nature, happening only to children that are evidently of this habit of body, or those belonging to the poor, who are neglected and dirty. I met with a case which was strongly suspected to proceed from a different cause by the parents of the girl, but which I firmly believe had no such origin, as it gave way to cleanliness, the application of lime-water and calomel, and purgatives occasionally given, which will be the practice to be pursued in all such cases.

ON GLEET.

This disease, which is extremely difficult to cure, is a common consequence of gonorrhœa in both sexes. Gleet is a discharge from the urethra, ceasing to communicate, as many think, a similar affection, on having connexion with another: respecting the period when gonorrhœa becomes gleet, and thereby is unable to create infection, much difficulty exists; indeed, it is almost impossible to draw limits of duration justly. Five months have elapsed between a man cohabiting with two women, at two different times, and yet he communicated to the second woman the disease. I have known a gentleman who took no pains to get rid of a gonorrhœa, have it as a companion for ten months; he had it nine times before, and defied any of the boasted clap doctors to cure him as expeditiously as nature generally had previously: in fact, he had paid five pounds to one, and the same to another, in the first and second attacks, and still the gonorrhœa was not diminished; the dread of strictures precluded his ever using injections of any kind.

As to the gleet in women, it is still more difficult to say when it ceases to be infectious, as a female has clapped a man though she had previously abstained from coition during a period of twelve months; and a case has been met with where the time has been as long as two years. A man has infected his wife, who had a gleet for twelve months, and was absent from her so long.

The seat of gleet is the same as gonorrhœa; the discharge is similar to the white of an egg in appearance, consisting of globular bodies contained in slimy mucus; but by intemperance, or riding on horseback much, or by venereal excitement, it will be completely changed, becoming yellow and opake. It often has its foundation in stricture; therefore, when this exists, the gleet cannot be cured until the cause of it is removed. It is not peculiar to weak or relaxed constitutions. The *cure* consists in effecting a change in the action of the parts, and this may be attempted in three ways, constitutionally, locally, or sympathetically: and the power of medicines, taken internally, may be divided into specific, strengthening, and astringent. By specific, are meant such medicines as produce a specific action on the parts; these are the balsams, turpentines, cantharides, &c. Strengtheners are, bark, the salt of steel, sea-bathing, cold-bathing, &c. Astringents are, the bark in decoction, the sulphate of zinc, alum, lead, &c. The best general treatment is the exhibition of the bals. copaib. combined with the spir. æther. nitr. in equal proportions, or the bals. copaib. and the pulv. cinchon. lancif. made into an electuary. An injection must be used of the muriate of mercury two grains to a pint of water. It may be gradually increased in strength, if required. The pulv. lyttæ one grain, terebinth. chio. five grains, ft. pil. omne nocte sumendus, is very useful. Another good injection is composed of ten grains of ammoniated copper to two ounces of water. An injection much used is made of the cupri sulph. gr. ij. aqua fʒiv. If these injections should not have the effect of making a cure, they had better be left off, and a bougie must be used two or three times daily, dipped in the bals. copaib., or in equal parts of it and oil. This will have considerable influence on the disease. Some cases will only yield to mercury; therefore, when gleet is obstinate, the hydrarg. muriat. may be given. A blister applied on the under side of the urethra will now and then cure, so will electricity, excess in drinking, and riding on horseback. Rest and quietness must, however, be attended to in most cases.

LECTURE XXXII.

ON SYPHILIS, OR THE VENEREAL DISEASE.

CHANCRE.

THE first sensation that induces a person to suspect his having contracted the venereal disease, is an itching of a circumscribed kind, felt on the penis; on examining the place a day or two after the irritation has made its appearance, a small pimple will be observed projecting, having a white head, with a quantity of matter in its centre: on the head being rubbed off the contents will be seen, which is not pure pus, but inclining more to that description of matter termed sanious; it is mixed with blood. A deep cavity will remain, the edges of which are ragged and thickened around: the surrounding inflammation is not of a healthy kind, but of a livid colour, resembling that resulting from venous congestion. The best diagnostic symptom by which chancre may be distinguished from an inveterate sore, is the deep thickening of the skin and integuments around the ulcer, in this respect, resembling that which exists after the application of vaccine, variolous, or other poisons, to the surface of the body: by nipping up the skin between the fingers, this hardness will be particularly evident, even to the most inattentive observer. If a sore be found upon the genitals *without showing these symptoms*, it will always be found merely an excoriation, and as such may be treated.

The seat of chancre is various: it is found seated upon the glans, at the corona glandis, or on the prepuce. A common seat of it is on or at the side of the frænum, which often goes on to the destruction of the part, unless the constitution is good, and mercury is freely and early administered. A part not very common, though occasionally affected with chancre, is the lips of the urethra, or about a quarter of an inch down the canal: when this is the situation, more particularly the latter, it is very liable to be mistaken for gonorrhœa, without the surgeon attentively examines the different symptoms. The discharge in this case is very unlike gonorrhœal, the former being sanious, and the latter, at first albuminous, afterwards resembling pure pus: besides, if the inflammation do not run very high, when the lips of the urethra are pressed, the thickening is so evident, that no deception can exist. Sometimes the ulcer may be seen upon opening the lips of the urethra. Chancre is not unfrequently met with upon the body of the penis: in this situation it loses many of its discriminating marks; it is in the form of an encrusted sore, covering an ulcer containing matter mixed with blood; when this is removed a deep wound is left, not having the hard edges which chancre has, when seated on the glans, &c. Now and then the scrotum underneath the penis is attacked; in this respect the same effect is produced on the glands of the groin, as if the prepuce were affected.

Venereal matter differs from gonorrhœal: the former, when applied to a secreting surface, produces inflammation and ulceration: the latter, when applied in a similar situation, produces inflammation and a discharge, without exciting ulceration. The former induces the same disease in the neighbouring glands, the latter does not.

Treatment.

It is recommended to treat a chancre with caustic, but I do not approve of this mode: it has two bad effects: it often induces a disease of the glands of the groin, where no previous disposition existed, by its irritating quality, and by the healing up of the sore, it makes the surgeon at a loss to know the effect which mercury has wrought upon the disease, through the medium of the constitution. It frequently has happened, that when the chancre has been healed in a very short time by means of caustic, the exhibition of mercury has not been persisted in, under the idea that the disease has been eradicated; but in a short time secondary symptoms make their appearance, extremely difficult to remove; therefore, if the patient be anxious to have the local disease removed early, caustic may be applied, but mercury must be given as long as if nothing of the kind had been used. The shortest space of time that this medicine should be used is three weeks, that its visible effects may be produced, and perceived on the constitution, which may be estimated by the discharge of saliva from the mouth, for that space. The sore will frequently have healed long before this period has elapsed, yet, notwithstanding this, a gentle salivation must be kept up for the above-mentioned time, or in some cases longer, as all the appearances of hardness must have gone off, previous to the discontinuance of the mercury. Indeed, as a general rule, mercury must not be laid aside under a shorter time than *a week at least after* the sore has healed. The best form to administer this medicine is the mercurial pill, ten grains at night, and five grains in the morning; to this may be added three-fourths of a grain of opium: this will prevent its passing off by the alvine excretions. With regard to the local applications which it is requisite to make use of to chancre—one of the best is the black wash (made of lime-water and calomel) if the patient be not of an irritable habit of body. Calomel sprinkled upon the sore, or calomel mixed up into a soft paste, with mucilage of gum arabic, is very beneficial. The hydrarg. muriat. dissolved in water, or lime-water, will be of service. The ungt. hydrarg. nitr. is frequently made use of, but *any applications* in the form of unguents to venereal sores are not approved of. When it is necessary to use the red nitrate of mercury, it will answer best rubbed down with the conserve of hips; but lotions applied to chancre are always to be preferred.

The pursuance of this mode of treatment is only recommended in those cases where the symptoms do not run very high. In some, the pain and inflammation will be very great, and phymosis will be introduced. There will be a general and deep redness in the parts, with great discharge from under the prepuce: when these are the existing symptoms, a continuance of the use of mercury will only exasperate them: it should be, immediately they are observed, left off, and thus, abstaining from the exhibition of the medicine, is the *great secret of those* who practise this branch of the profession with success. It will be right to abandon the use of mercury for some space of time, until the inflammatory symptoms are entirely, or, in a very great degree, subsided in the part, more particularly if there be any appearance of sloughing. A wash should be used, composed thus, ℞ liquor. plumb. acet. ʒss.; tinct. opii ʒiij.; aqua fontanæ ℥iv. M.; or the black wash with opium. Pieces of lint, or linen, wetted with either, are to be kept constantly applied to the part. A brisk purgative of calomel and rhubarb may be given, but a continuance of purging must not be followed, as it will weaken the patient and increase the tendency to sloughing. If the inflammation should not subside, a leech or two would be advisable. The black wasn with opium may be injected under the prepuce, in order to clear away the discharge, which is apt to collect there and cause irritation.

Observe. A chancre, in the *very earliest stage*, I think, might be successfully treated with caustic, and render mercury altogether unnecessary: but I must remark, it is seldom, if ever, patients apply soon enough to render this practice justifiable. Many practitioners salivate their patients with mercurial ointment, and never administer this medicine internally, but from the concealment requisite in these cases, it could not be adopted without discovery, from the perceptible marks on the linen: the other plan is by far the cleanliest, and I would recommend its adoption in private practice. In the hospitals, friction with ointment is universally pursued.

PHYMOSIS.

A chancre seated on the prepuce during the healing process, often causes phymosis, from the contraction of the prepuce, as the inflammation abates and subsides. It is to be relieved by an operation. Sometimes the thickening will go off, and the phymosis will be spontaneously cured, so that it is always best to wait a short time, and the penis should be occasionally soaked in warm water, in order to facilitate this desirable effect: when it cannot be relieved, pass a director three-fourths of the way to the corona glandis, along the dorsum penis, then direct the patient to retract the prepuce as much as he can, pass a curved bistoury along the director to its extremity, in which place it must be passed through the prepuce, and by drawing it out the skin will be divided to its edge In whatever way phymosis is produced, this will be the mode of operating to remedy it, even when it results from natural causes in children. A speculum, with a screw in the centre, so contrived, that when used, it is capable of being enlarged, or diminished in size at pleasure, is advised to be introduced within the prepuce in cases of phymosis, and the parts are to be gradually dilated, allowing it to remain until the prepuce can be drawn back over the glans: this is a very ingenious invention, and will occasionally succeed. Cases of phymosis will sometimes, though rarely, occur, in which the prepuce has formed numerous adhesions to the glans throughout its whole internal surface; this is mostly resulting from natural formation, and here the operation will be unattended with success.

When there is great tightness of the prepuce, and it is with difficulty drawn back, it will remain back without a possibility of returning it, and cause the disease which is termed PARAPHYMOSIS. In proportion to the length of time which the glans remain in this situation, is the danger of mortification. It is in general accompanied with an effusion of serum into the prepuce on the anterior part of it, and behind this, the skin of the prepuce forms a tight ligature around the penis, just beyond the corona glandis.

Treatment.

It is too frequently the custom of surgeons to direct the application of a warm poultice to the part, which is absurd, and only aggravates the disease. The point of a lancet should be passed into the prepuce to evacuate the serous fluid effused into it; and when this is done, the glans must be compressed by the fingers of a surgeon, in order to expel all the blood out of its cells, and when the pressure has been continued for five minutes, place the thumb at the extremity of the penis, and surround the prepuce with the other hand; then press the former back, and at the same time draw the latter forward. Very few cases occur, which have not existed longer than fourteen or twenty-one days, in which this plan fails to succeed. The glans, previous to the final attempt, may be put into cold water, which will assist the surgeon in his efforts. If this be pursued, I do not believe it will ever fail: but where it has been of long continuance, the skin requires to be divided with a lancet, which relieves the constriction, and it will be best to insert a director under the part, and cut down through to it.

When paraphymosis has continued some time, sloughing will not unfrequently take place of a portion of the glans: in this case the operation of *circumcision* must be performed, which consists in cutting off a circular portion of the prepuce.

Besides these effects of chancre, it sometimes happens, that the ulcer occasions such excessive irritation, and such a high degree of inflammation, attended with great pain, that the deplorable situation of the patient requires immediate relief. In these cases mercury must be laid aside, and a lotion, composed of the nitric acid six to eight drops, distilled water four ounces, will be of great advantage, and more effectual in removing irritation than any other application that I know of. The bowels should be cleansed with a brisk cathartic, and then opium, combined with bark, must be thrown in. When the symptoms are much abated, the spir. æther. nitr. and the hydrarg. muriat. are to be given: these may be given, in the proportion of one grain and a half of the latter to half a drachm or a drachm of the æther: the *quantity* at each dose will depend on the capability of retaining it on the patient's stomach: probably twice or three times will be often enough in the course of the day. If much mercury be given, it will have the effect of inducing a return of the irritable state of the local disease. The ulcer is sometimes apt to get into an indolent state, in which case the application of caustic will be found serviceable; if it still continue thus, give the bark, and use a wash composed of the nitrate of silver half a drachm, water an ounce, over which, linen moistened with the black wash, may be applied, or the ulcer may be touched with a probe, every day, dipped in the nitric acid.

The most destructive cases are those in which sloughing of the glans or prepuce takes place. When the prepuce sloughs, a portion of the penis also mostly accompanies it; indeed cases have been seen where about an inch of the urethra has thus separated. In these cases, if mercury be used, it will induce the sloughing disposition to extend to the contiguous parts. The *local applications* are several; one of the best is the black wash, applied as hot as the patient can bear it. The nitric acid lotion may also be used in the proportion of two drops of the acid to an ounce of water. A poultice composed of carrots and linseed, one part of the former to three of the latter, will have the effect of removing the slough, and at the same time correcting the disagreeable fætor which is present. No application that can be made use of is superior to half an ounce of yeast, half a pint of water, made up into a poultice with linseed meal or oatmeal. Turpentine applications, made hot, are advisable. Another good remedy is conserve of roses, one ounce; tincture of opium, and liquor of acetate of lead, of each two drachms. Fomentations of cicuta and belladonna are serviceable. A solution of opium will be productive of benefit, also the pulverized carbon, or a cataplasm made of it. The *internal* medicines from which most advantage will be derived, are ammonia from five to ten grains, mosch. gr. x. mucil. g. acacia. q. s. ℳ. ft. bol. ter in die sumendus. Opium has been generally recommended, and with great propriety; it is much better than bark, as the latter will often have the effect of disordering the stomach and exciting febrile symptoms. Patients have generally a pulse from 120 to 130 in sloughy cases of this description, but opium will very soon reduce this undue degree of velocity. The decoction of sarsaparilla is an excellent remedy, and more particularly where the irritable state of the local and constitutional disease has arisen from the injudicious exhibition of mercury. Wine or porter may be allowed, unless they excite a considerable increase in the pulse, in which case they must be laid aside. The surgeon, in these cases, sometimes is called to suppress hæmorrhage from the penis, in consequence of the separation of the slough: here lint, moistened in spirits of turpentine, and wrapped round the penis, will be found mostly effectual; but if it fail, the artery must be taken up. As this sloughing disposition arises from a high degree of irritation and inflammation, it is a query whether leeches might be applied with advantage—experience must determine this point.

It occasionally happens that the urethra sloughs open at the frænum, and the urine flows out from the opening thus formed. In this case, an elastic catheter may be introduced down the urethra, and allowed to remain whilst the edges of the canal are brought into contact over the instrument; and this must be effected as far as possible, and success will commonly attend efforts thus made, if one-third of the circumference of the canal be lost; but when more than this is deficient, the chance of success will be proportionally diminished.

When a chancre is situated at the lips, or just within the urethra, it will often produce a stricture at the part, which cannot be cured by common bougies or caustic ones. A piece of bougie, about two inches in length, must be introduced, smeared with some unctuous substance: this must be allowed to remain an hour at first, then longer, until it excites suppurative inflammation in the part, by which the stricture will be removed.

CHANCRES IN WOMEN.

These are seated on the inside of the nymphæ and labia, rarely at the orifice of the vagina: now and then an opening is formed between the vagina and rectum, for which there is no cure.

Treatment.

By means of the black wash and mercury; in other respects the same as in the male subject.

VENEREAL WARTS.

These excrescences, which are found arising after chancre and gonorrhœa, although termed venereal, are confidently asserted not to be so. They are often the production of irritating applications, which have been made use of during the continuance of the two mentioned complaints. They are growths of the cutis, and do not require mercury to remove them. They are broken and divided on the surface, similar to warts found in other parts of the body. In asserting that these warts are not venereal, I would not wish to be understood as including those situated near the anus, particularly in the female; they are evidently produced by the direct application of venereal matter to the parts, and are in effect chancres, covered over with an incrustation: they require mercury to be administered before a cure will be made.

The species of warts previously alluded to are of two kinds; the one soft, and from which bleeding occasionally takes place; the other firmer, similar to warts upon the hand. Those of the first description are easily eradicated by a regular application of a strong solution of the liquor. plumb. acet. Poultices will frequently bring away great numbers of these at once. The black wash, as well as a lotion composed of the hydrarg. muriat. has been applied with advantage. The tinct. ferri muriat. will succeed, so will blisters. The ung. hydrarg.

fort. and the application of a poultice, is a good plan. When they are obstinate, equal parts of the powder of savin, acetate of copper, and the red nitrate of quicksilver, will succeed. A saturnine solution of the hydrarg. muriat. is a good irritating wash—it should only be used once a day.

The other species, those of the firm kind, are said to be very difficult of removal: but I do not think this is the case. To destroy the worst kind of warts that are met with upon the penis, nothing more is necessary than to use a small quantity of arsenic finely levigated: the warts are to be sprinkled with it, which is to be allowed to remain on, taking care to avoid the adjacent parts from touching the arsenic by means of lint, applied previously all round. It destroys the warts by inducing inflammation and suppuration. In the male, this application will seldom, if ever, fail; but in the female, from the great number which are occasionally met with upon the labia, it has. In these it had better be applied on lint, in the form of ointment, ʒj. of arsenic to ℥j. of lard, every, or every other day, according to the degree of inflammation produced by it—if great, a poultice ought to be applied. A powder commonly in use for these excrescences, is one composed of savin, as before detailed, but it is much inferior to arsenic. Warts have been seen seated on the corona glandis; these, by pressure, have found their way through the prepuce, and in course of time, the glans has made its way through this opening; this will require an operation similar to that of phymosis, or that of circumcision. Warts in the male seldom or ever become larger than a walnut, but, in the female sex, they are not unfrequently seen much larger.

VENEREAL BUBO.

This affection takes place most frequently upon the side on which the chancre is seated; but it is not always the case, for I have known one of the glands in the groin enlarge when the chancre was situated on the opposite side of the penis. It is extremely rare to find more than one venereal bubo on a side: occasionally more than one gland is enlarged, but it is only in one that the poison exists; and the others enlarge from irritation, not from the application and communication of venereal matter. One chancre will now and then (though rarely) occasion a venereal bubo on each side.

The symptoms are merely those attendant upon inflammation of a gland from any irritating cause being applied to the absorbents which enter it, with this exception, that here there will be an increase of pain in the inflamed part towards evening and at night, and this is the case in almost every variety of the venereal disease.

Treatment.

Mercurial frictions are to be immediately had recourse to, and chiefly depended on for the cure. One or two drachms of the strong mercurial ointment may be rubbed in every night, and if this be employed in an early stage, generally speaking, nothing more will be required.

I have here to remark, that in every case, previous to using mercury, it is most advisable to prescribe an active purge, and in this case it will have the effect of diminishing the inflammation, and will induce the absorption of the gland more readily. If, after these means are had recourse to, the pain in the bubo increase, and the cuticle begins to look red, the mercury must be discontinued, and leeches applied; afterwards, washing the part with the saturnine lotion very frequently: these means must be persisted in three or four days, by which time the probability is, that the inflammation will be reduced, when the use of mercury may be again resorted to. If, during the inflammatory stage, the frictions were to be continued, it would only serve to hurry on the ulcerative process.

When it is found that these efforts are ineffectual, and that the bubo has commenced the suppurative process, which will be evinced by a circumscribed redness around the tumour, with an evident fluctuation in it, desist from the use of the frictions; the reason of this is, if mercury were still applied during the suppurative inflammation, it always has the effect of rendering that inflammatory action unhealthy, and causes a sloughing ulcer. The case must now be treated by fomentation and poultice, locally, until the bubo is fit for opening, and discharges its contents; and by bark and wine constitutionally, combined with a generous diet.

I would again observe, the great secret in the treatment of these cases, consists in never giving mercury during the inflammatory stage; as this remark is of consequence, it deserves to be borne in mind. When it subsides, mercury may again be employed; as a general rule, I should say, after the bursting, or opening of a bubo, a week ought to elapse before it is recommended.

Supposing the diseased gland has suppurated, and still appears not inclined to discharge its contents, though encouragement has been given it by warm applications, it is requisite it should be opened either by caustic or incision. I should prefer making a puncture with a lancet to the extent of half an *inch*, and if the skin be thick, and the opening likely to close, dip a probe in the nitrous acid, and touch the edges. When the patient is extremely timid, a drop of this acid may be put upon the part of the swelling, where the fluctuation is most distinct: this will, by its corrosive effect, generally make an opening into the cavity of the abscess in twenty-four hours after its application.

When matter is formed, and the absorption of the integuments goes on excessively slow, and when, at the same time, scarcely any redness is present, and the pain has ceased, except when pressed on, it will be found advantageous to make use of mercury, so as to cause the absorbents to act, which will tend to the promotion of the absorption of the contained matter (if inconsiderable in quantity), and its ultimate dispersion. If buboes are indolent, and have no appearance of discussing or suppurating, use mercury, and apply a blister to the part. If the bubo be large, two openings ought to be made, one at the superior, the other at the inferior part of the tumour, which will prevent the formation of a sinus; it will be proper to carry a thread from one opening to the other, to produce an equal irritation. Sometimes enormous swellings of the glands in the groin are seen, four inches in a perpendicular, and three in a transverse direction, in diameter. In these cases, by no means use mercury, but improve the constitution with bark, ammonia, &c. and also change of air, as it proceeds from a scrophulous disposition in the habit of the patient; occasional purgatives ought to be given.

When a bubo has burst, and the ulcer is indolent, that is, shews no disposition to granulate and cicatrize, apply caustic to the edge of the sore once every twenty-four hours, and keep it continually moist with the black wash: solutions of the nitric and sulphuric acids are had recourse to with the most decided advantage. In some subjects, even desisting from the use of any application, and allowing a scab to form over the ulcer, will facilitate the formation of granulations, and the cicatrizing process, more expeditiously than where the surgeon is over-officious.

Erysipelatous inflammation, accompanying bubo, is to be treated by purgatives, bark, &c.—Mercury would be highly improper.

Sometimes a sinus will form in spite of the surgeon's efforts: if superficial it should be dilated: if deep seated, and running in such directions as to preclude the possibility of its being opened without a good deal of danger being incurred, injections may be used, composed of the hydr. muriat. gr. ij. aqua ℥j. M. or the nitric acid, or the tinctura lyttæ ʒj. to aqua ℥j. M.

Some cases are seen, where the healing process cannot be induced almost in any way that can be devised, and here it will be advisable to try setons, or laying open the sinus: in the latter, very great caution must be taken, on account of the contiguity of the parts, so important and numerous.

The lymphatic glands in the groin take on now and then a disease of a fungous nature, projecting through the skin. The treatment will consist in the application of the nitrate of silver, once in the day, and the black wash, or else make a number of little points of paste, and dip them in the muriate of mercury in solution, and introduce five or six into the gland, which will produce a sloughing of the parts in about four days.

The glands in the groin often continue enlarged, and in an indolent state after a mercurial course: here blisters should be used to disperse them.

Buboes, as well as chancres, not unfrequently put on a sloughing disposition, and will occasionally destroy life. Several cases have been seen in which the femoral artery has thus separated: in one, this artery was laid bare all around, yet the patient recovered as the wound filled up with granulations. There are many patients that die annually, in the London hospitals, from sloughing buboes. The treatment is exactly similar to that of chancre similarly diseased: carrot poultices, fomentations, &c. A sloughing bubo is often caused from the injudicious use of mercury, and the surface thus exposed will be very extensive. I have seen several lamentable cases of this kind. It is to the interposition of the sheath surrounding the femoral vessels, that many patients owe their existence.

BUBOES IN WOMEN.

Two of the situations are different to those in men. When the chancre is on the labia nymphæ, the venereal matter will be carried along the round ligament, and the seat of the bubo will be there, just before it enters the abdominal ring: when the chancre is more backward, then the bubo will be situated between the labia and groin, or in the groin itself, similar to men. What I have remarked on this complaint in men, as to treatment, will be wholly applicable to the same in women.

LOCALITY OF BUBOES.

These affections are entirely local, having no more connexion with the constitution than chancres, from which they arise; some, notwithstanding, have been absurd enough to consider them in the light of a critical deposit; but why, if this were the fact, should the absorbent glands be affected? and why should not the glands in the neck, and elsewhere, be affected as readily as those in the groin, or those nearest the source of absorption? and lastly, if critical, why should it be necessary to administer mercury?

The difference in the treatment of buboes depends on this: mercury can only cure the specific disposition of the inflammation: sometimes there is a great deal of common phlegmonous inflammation; at other times, erysipelatous, and in some the inflammation partakes of the scrophulous diathesis: the specific requires mercury; the common, bleeding and purging, &c.; the erysipelatous, bark, &c.; and the last, cicuta, sea water poultices, &c.; abstaining from the use of mercury in all except the first. Emetics have been known to cure buboes, even where suppuration has taken place; they seem to cause a disposition for absorption. A gentleman went to sea with a suppurating bubo, sea sickness occasioned its entire dispersion. A surgeon ought to be acquainted with the course of the absorbents; this explains why a boil on the buttocks causes a swelling in the groin, &c. In some habits, although the venereal disposition is completely destroyed, yet a bubo will not heal; in these, hemlock used externally and internally, joined with bark, is the most effectual remedy; sarsaparilla, sea bathing, and poultices of sea water, are all serviceable at times; goldbeaters' water, an application in use at the Lock Hospital, often does service; lemon juice or oranges is recommended.

SECONDARY SYMPTOMS OF SYPHILIS.

The secondary effects of *lues venerea* are numerous; but of all, that which occurs in the throat is most serious, and will occasionally prove destructive to the patient. When the venereal poison is carried into the system, it attacks three parts more particularly, the *throat*, *cuticle*, and *bones;* and nearly all the secondary symptoms may be classed under these three distributions, or heads: there are certain anomalous symptoms sometimes seen, but they are very rare.

Of the Poison upon the Throat.—When in this situation, the most common parts that it attacks, are the tonsil glands, appearing in the form and character of chancre as situated on the penis; it is a deep sore covered with a white slough, the edges ragged, and the adjacent circumference thickened; there is also a dark redness around from venous congestion. The character by which this species of ulcer is to be known from others is so very well marked, that no person can feel himself at a loss when put to the test of decision. The pain is slight, except on swallowing, when in a few cases it is felt running up the Eustachian tube to the ear; these symptoms are more complained of by the patient in the evening than in the morning; the throat constantly feels husky, but never sore; and this arises from the quantity of mucus thrown out upon its surface. This disease in the tonsils is the least dangerous of any of the venereal affections of the throat: even when the tonsils are totally destroyed, they occasion no other feeling than dryness in the throat, more than what previously existed before their loss.

A second seat of the disease is in the palate, and here, although it never proves fatal, yet it may be very serious in its results to the patients, as it will occasionally destroy the voice, and almost entirely the power of deglutition, by the destruction of the velum pendulum palati. It commences by a small speck upon the integuments covering the os palati, and the ulcer, though small, extends to the bone, which also is attacked with the ulceration: it mostly begins between the velum and the bony palate. An opening has been seen thus formed between the mouth and nose an inch and a half in length, and one inch in breadth, the velum being adherent to the posterior part of the fauces. Sometimes the ulcer is placed in the back of the fauces, behind the velum pendulum palati. A third seat is in the larynx, and this is the most dangerous of all; a great many cases have been seen of this kind: it mostly attacks the sacculi larynxi in the first place: occasionally the larynx will exfoliate in this disease, in which case the patient may recover. The thyroid cartilage has been found with a large aperture in it, from the effects of venereal poison. The disease in the larynx has the following symptoms: hoarseness, cough, and difficulty of breathing; it is also frequently attended with pain in the bones and venereal eruptions. As the disease here may prove of such importance and so very destructive, immediately on discovering its existence the most vigorous methods must be pursued, as mercurial fumigations, and the hydrarg. muriat. internally, &c.; for the other diseases mercurial frictions may be adopted. If the tonsils be sloughy, a little borax powdered and sprinkled on them will relieve: the mel. ærugin. has been found a very good application, but is less powerful than the borax and honey. The nitric acid gargle, or gargle of the hydrarg. muriat., has been used with the most decided success. The sores in the roof of the mouth may be washed with a weak solution of the acids, which will correct the fætor of the breath, and of the discharge likewise, and at the same time induce a more healthy state of the ulcer. When the sore heals, if an opening or fissure remains, a false palate must be used: these are now very ingeniously made. If the openings are extending far back there is no remedy, as nothing will lie in contact with the soft palate without irritating it. An ulcer in the fauces seldom occasions any alteration in the voice, or difference in the power of deglutition, provided no other part has been affected. The use of the before-mentioned remedies will be also proper when the larynx is diseased, but from the distance that it lies back, it is scarcely possible to apply any thing to it.

VENEREAL ERUPTIONS.

The character of these differs from that of other diseases of the skin in many respects. The skin surrounding the eruption is of a copper colour, the sore is covered with a crust, and on its being rubbed off, a mixture of blood and imperfectly formed matter will be found. In addition to these appearances, there is the same thickening surrounding the ulcer in the skin and integuments, which marks a chancre elsewhere, and which exists only in venereal sores; hence it is possible to discriminate this species of cutaneous ulcer from every other kind to which the surface of the body is liable. The part upon which the eruptions first make their appearance, is on the scalp, in the form of scabs amongst the hairs; next the face becomes the seat of the affection, then the breast, and afterwards other parts, as they are seated more or less distant from the course of circulation: the palms of the hands will occasionally become affected with them, without the other parts of the hands or arms participating in the appearance. The whole of the back has been seen covered with these eruptions, but mostly between the shoulders. Nothing can be judged of them by their size, as they vary much in this respect; most commonly they are small, but are occasionally met with as large as a sixpence: when they are large and numerous, they leave portions of healthy skin insulated from the other healthy cuticle. There is little or no pain attendant on venereal eruptions, unless the patient is of an irritable habit of body, in which case they prove painful at night; also when the patient has been heated with exercise, or otherwise so as to perspire, there is itching and slight pain. Venereal eruptions are the mildest form of the secondary symptoms, and seldom prove fatal; instances have been seen where the patient was carried off.

Treatment.

Mercury given internally, and also introduced into the constitution by friction, will be necessary. If the eruptions are going on to a dangerous extent, the hydrarg. muriat. must be given dissolved in the spir. vin. rec. as often as three or four times daily. The best mode of giving it in feeble constitutions and tender bowels, is in small but frequently repeated doses. It is the best form of mercury in this species of the complaint, as it acts most powerfully and immediately on the stomach; and this action, on account of the intimate sympathy existing between that organ and different parts of the body, affects the skin more particularly than any other part. If the eruptions become very irritable, the nitric acid may be given with great advantage: it assists the mercury much by increasing the digestive powers, though it has little effect directly upon the disease. Some surgeons have asserted its capability of curing the disease, but I do not assent to this opinion: it is unquestionably a most powerful auxiliary. With respect to local treatment, the eruptions always do better if allowed to remain without being touched by any preparation. The crust alone should be allowed to cover them; but should they seem disposed to ulcerate, calomel, united with mucilage, will be advantageous to dress them with.

PHAGEDENIC ULCER.

This absurd term is applied to that species of ulcer, which often makes its appearance in consequence of the improper use of mercury; that is, by the employment of it during the inflammatory stage of a bubo, or when it is in an irritable state. It is nothing more than a very irritable sore, and one which is thought generally extremely difficult to cure: the character of it is, the surrounding edge being hollow and ragged, purple in colour, and the granulations on the surface white and flabby, being but imperfectly supplied with blood.

The Treatment

Consists in washing the sore once a day with a strong solution of the nitrate of silver one drachm to one ounce of water; dipping lint in this, and touching the whole extent of the sore with it, but more particularly the edges; the black wash must be applied over this, and a part of the black oxide of mercury, which remains at the bottom of the phial, must be put on the ulcers, from which they will derive great benefit: this wash must be kept constantly applied to the sore by means of lint or linen cloth, and the whole ought to be covered with a piece of oil skin. If the edges of the sore are very hollow and ragged, they must be touched with the nitrate of silver: if this treatment do not succeed, lotions composed of the vitriolic or nitric acids must be substituted, in the proportion of four drops to four ounces of water. If the irritation run very high, opium may be given, and also used as a lotion. Bark and the decoction of sarsaparilla must be prescribed, ammonia, &c.; but more dependence ought to be placed on the diet and regimen—wine, porter, &c. may be allowed.

VENEREAL OPHTHALMIA.

This may be considered as belonging to the eruptive species of the disease, and is mostly attendant on the cutaneous complaints. The characters are: a much less abhorrence of light than is experienced when inflammation is resulting from any other cause; it is accompanied with nocturnal exacerbations, and becomes worse in the evening: but the best mark to discriminate the disease, is by a circle of inflammation around the transparent cornea, situated on the tunica conjunctiva, having a white uninflamed space between it and the lucid cornea. It is often joined or combined with an inflammation of the iris: as this disease frequently terminates in the loss or great defect of the organ of vision in a very short time, immediately upon its being ascertained to exist, the most prompt measures must be undertaken, in order to prevent this danger. The use of mercury has an extremely quick effect in checking the progress of the disease. The muriate of mercury in solution must be given along with the decoction of sarsaparilla. When the symptoms are a little abated, *but not before*, mercurial frictions may be had recourse to.

VENEREAL DISEASE OF THE BONES.

Many bones of the body are liable to the attack of the disease, but the nasal bones seem more susceptible than any others. These are often affected, and the first symptom which denotes the existence of the disease, is a painful sensation extending across the bridge of the nose between the eyes; a tenderness is perceptible here on pressing with the fingers; then the skin becomes red, and large scabs, lined with blood and matter, are discharged from this part on blowing the nose: afterwards the bones exfoliate. The greatest part of the vomer has been discharged by the exfoliating process. Occasionally the ossa nasi are also destroyed in this manner, in which case the nose falls in, and permanent deformity remains. Much of the disfiguration may be prevented by taking away the portions of bone as they decay. The general *treatment* is to be the same as in eruptions, but the local treatment differs: here a solution of any mineral acid must be made, and a small quantity must be snuffed up the nose, by putting the fluid on the hand; if this cannot be done, a syringe must be employed to inject it up. This will have the effect of correcting the great and extremely disagreeable fætor, which is always present when this disease exists in bones, and at the same time the exfoliation will be expedited.

NODES.

A node is a swelling found upon cylindrical bones where but thinly covered with integuments: they are found on the malleolus internus, on the middle of the tibia, on the clavicle, ulna, and sternum, &c.: they are very rarely found on that part of a bone which is thickly covered with muscles and integuments. The pain attending their formation is generally obtuse, and more in the evening than in all the other varieties. Surgeons must be careful in ascertaining their venereal origin previous to their giving an opinion, as it very frequently happens that nodes will arise without any preceding venereal symptoms, and on persons who it is certain never had syphilis; in these latter cases of course they are not venereal. At *first*, the seat of the disease is in the periosteum, and *not in the bone*, as some authors have asserted. It is here simple adhesive inflammation, and consists of an effusion of a glairy albuminous fluid situated between the periosteum and bone. If the disease continue its progress unmolested, this matter appears to be absorbed, and good pus is poured out by the extremities of the arteries into this cavity, which takes place before the bone is affected. When this matter is formed, the skin over the swelling becomes red, and there are evident marks of suppuration. Fluctuation also is apparent; but this is no rule to judge of the existence of pus, as this symptom is perceptible when the glairy fluid exists. The integuments on the surface becoming absorbed, the matter is discharged through the opening, and the bone is found in a diseased state. This is the progress of the complaint when allowed to remain, and go through its natural course. Sometimes nodes will make their appearance of an evening and subside in the morning, and this will continue several days, until the periosteum becomes thickened, and takes on a permanent diseased state, when it will be found to continue both day and night without any further disappearance, unless reduced by the application of mercury.

Treatment.

Mercurial frictions can alone be depended on for the cure of the disease. The local treatment is very simple. If there be any great degree of irritation and inflammation, the soap plaster must be applied on the node. If those symptoms do not run so high, but are moderate, the empl. litharg. comp. may be put on.

If the inflammation go on to the production of a fluid, leeches must be applied, and the liquor. acet. plumb. dil., or the liquor. ammon. acet., may be used as a wash, with the intention of discussing the tumour. A blister may be put on the part, and very great advantage is derived from the application of it. If a glairy fluid be formed, and there is no suppuration, this last being indicated by a redness on the skin, the surgeon must not attempt on any account to open the abscess, as the use of mercury will be quite sufficient for the removal of the swelling; for if the swelling be imprudently opened at this stage of the complaint, the bone will certainly exfoliate, and the case will be rendered extremely tedious; but if pus be formed, mercury will never cause the absorption of it, in which case it will be requisite to evacuate the contents by means of a small incision.

BONES OF THE CRANIUM.

These are occasionally affected with this complaint—the disease in these parts is the same, only attended with more danger. Very large collections of pus have been seen under the cranium, and also several fatal cases of the disease when in these bones. In general it is the result of bad constitutions, or of the complaint being neglected. When the venereal disease is situated in the bones, it requires a much longer course of mercury than in other parts, and in general, as the vital principle of any part is less, the more mercury does it require to eradicate the disease from that part.

There are other parts of the body that are occasionally affected with syphilis; but they are generally easy of discovery: the testes are sometimes enlarged from it: here a mercurial course will recover them. Patients will now and then complain of pain extending down the thighs, legs, arms, &c.; when this is the case, it is truly venereal; but when they tell the surgeon the pain is seated in the joints, the disease is rheumatism.

The venereal virus is sometimes taken into the system by means of inoculation; in this case the disease is extremely irritable and inveterate, and also serious to the person who has it. Practitioners of midwifery are very liable to it, and several cases could be related of this kind. The constitutional fever runs so high occasionally, that the patient's life is endangered by its continuance, in which case the symptomatic disease must first be attended to, and then the primary.

GENERAL REMARKS ON SYPHILIS, AND ON ITS TREATMENT.

From what I have detailed of the venereal disease as to its various symptoms and appearances, it is evident that only some parts of the body are liable to be attacked with it, and these are, comparatively speaking, but very few, the greater number escaping infection by their being unsusceptible of the complaint: thus the skin, or rather the integuments of the penis, the glands situated in the groin, the parts contiguous to the throat, the skin generally, the eyes, and some of the bones, are the only parts of the body which are liable to the disease.

The vital organs, as the brain, the cavity of the thorax and of the abdomen, the blood-vessels, the nerves, &c. are never affected with it. It is a wise provision of nature, that this poison in its passage through the lymphatic system to the blood-vessels, only should affect a single gland, or at most two; were this not the case, many, if not every patient who contracted the disease must perish from the suppuration of the numerous glands which the virus passes through in its progress to the thoracic duct.

The symptoms of the venereal disease are divided into two distinct species, the primary and secondary. Of the *first*, chancre and bubo may be enumerated; but the latter ought to be ranked as an *intermediate* description of symptoms. The secondary are the diseases of the throat, skin, and bones. Thus then there are, one primary, one intermediate, and three secondary.

The venereal disease, when classed properly, is simple, and easily discriminated from any other, though it is in general considered as difficult to distinguish it, in all its various forms. This idea has arisen from persons supposing that many other parts, besides those enumerated before, are liable to the disease, which opinion is erroneous; as some parts of the body only can be attacked with infection, so some persons appear to be more susceptible than others. A person who has been much in the habit of cohabiting with infected women, will sometimes not imbibe the complaint, though the females may have several chancres at the time: and yet if another person do the same, he will immediately contract the disease. A person of very debauched habits, will occasionally be found, to whom it is scarcely possible to give the disorder, though he exposes himself to every variety of it, and has connexion with the most impure females.

The disposition to gonorrhœa and syphilis appear to be less according to the frequency of the person's being attacked with these complaints. A person who has had two or three attacks of gonorrhœa, will have connexion with a woman who is unwell without her communicating the disease to him, while if one come to her immediately after who has not experienced the complaint, he will carry it away with him. A surgeon ought carefully to distinguish between gleet and gonorrhœa, for a person slightly affected with the former, on having connexion will find the discharge often increased, which he will conceive to be gonorrhœa, but which in reality is merely a greater flow of matter, in consequence of the irritation and inflammation attendant on erection, and which matter is perfectly incapable of communicating any infectious disease.

The venereal disease has been considered by Mr. Hunter as merely a local complaint, unattended with any constitutional fever or affection; but many of the surgeons since his decease differ with him decidedly in this respect; for the secondary symptoms are always accompanied with constitutional irritation and fever, which is evinced by the exacerbation coming on in the evening; the degree of fever comes on towards five or six o'clock in the evening, and abates about the same hour in the morning; and the remainder of the day the patient remains in good health as usual. Even before the appearance of venereal eruptions, febrile symptoms have been known to occur for the space of several days: and this has been treated as proceeding from general causes until the skin became diseased, which evinced the nature of the complaint: the increase in the severity of the symptoms occurring in the evening is now considered to be constitutional.

The matter produced from the secondary ulcer differs very much from that discharged in chancre, having no power to communicate the disease when applied upon the skin, or inserted under it by inoculation. This discovery was made (among numberless others) by Mr. Hunter, who made many experiments, in order to verify the truth of it; and since his time others have followed his steps, and similar tests have been made at almost all the hospitals in town, all of which coincide with those made by him. The matter from a sore throat not being able to communicate the disease, it will therefore be impossible to be infected by kissing a person who has venereal ulcers, as they cannot transmit the disease to another, and it can only be done by chancre; thus there are only chancre and gonorrhœa from which the two diseases can be caught; the matter from the latter is very liable to produce the disease—it behoves surgeons to be extremely careful respecting their instrument, &c. Bougies which have been introduced into the urethra of a person labouring under gonorrhœa, will certainly produce the disease if passed afterwards into that of a person in health. A case of this kind occurred some time ago—an old man of seventy caught a severe clap, by having an elastic catheter introduced which had previously been used on a person who had a gonorrhœa.

I have already remarked that it has been ascertained in the most satisfactory manner, that the matter of gonorrhœa, when inserted beneath the skin of the penis, will not cause chancre or any other venereal disease: the experiment has been made so many times besides the case I have inserted, that not the least doubt exists at the present time of the difference between the two diseases.

It has been stated by many authors, that the fœtus in utero cannot contract the venereal disease, but I entertain, with others, a different opinion; from the experience of an eminent surgeon, who has vouched for the fact, I will take upon myself to assert positively, that it can; that a child can be contaminated while remaining in utero. Mr. Hunter was of the former class of writers. I have never seen a child born with venereal eruption on the skin; but I have seen them with the disease existing a fortnight subsequent to the birth of the infant. They chiefly made their appearance on the nates, on the soles of the feet, and on the palms of the hands; the latter being most commonly affected. In these cases, children require nothing more to cure the disease than the milk of the mother, if she be taking or using mercury herself. I am of opinion, that a woman who has a child in utero is incapable of being cured of the venereal disease, as frequently large quantities of mercury have been given, and continued a long time without destroying the virus; for although apparently they were cured, every symptom being completely removed, yet soon after the child had been born, the disease reappeared, requiring a complete course of the medicine to cure it.

It requires a good deal of experience to distinguish in every case, the venereal disease from others that resemble it: but when a surgeon has once seen the different varieties, (and every young man has a fine opportunity in the wards of the London hospitals of seeing them), the diagnostic is not attended with much difficulty. Persons will frequently apply for relief, supposing they have caught the disease, when, in reality, it is merely an excoriation which they take for a venereal ulcer; here some mercenary wretches, who are a disgrace to their profession, have an opportunity of gratifying their propensities; but the conscientious surgeon, who has integrity and character to maintain, would spurn at such practices; if it be not accompanied with the surrounding thickening of the skin, it is the latter, and may be cured by the spirits of wine with water.

It sometimes happens, that after mercury has been given for some time, sores will break out upon the penis, and those have been thought venereal, but are no such ulcers; being entirely mercurial, caused by the long continuance of the medicine: they certainly resemble chancres in some degree, being ragged and sloughy; but they have not that circumscribed circle of inflammation around them which chancres have, nor the surrounding thickening: but they have mostly a good deal of inflammation extending about them. These ulcerations will soon heal, if they are frequently washed with warm milk and water, and the parts afterwards covered with dry lint.

With respect to bubo, if the patient have not had a preceding chancre, it ought not to be considered as venereal; on account of the glands in the groin becoming enlarged from a great variety of causes, independent of venereal matter. But now and then, a chancre will spontaneously heal, in which case, if a bubo be present, the penis must be examined; when if one have existed, there will be found some degree of hardness remaining which will point out the situation of it.

If several of the inguinal glands are enlarged, the disease will scarcely ever be found venereal, but generally either sympathetic or scrophulous.

With regard to sores in the throat, there are several kinds which may be confounded with venereal, viz. scrophulous; those arising from debility, independent of scrophula; and those which owe their origin to the free use of mercury. The venereal are resembling chancre in every respect; the mercurial are similar to phagedenic ulcers, as before described: the scrophulous generally begin by an enlargement of the tonsil glands, and when they are pressed from the outside, quantities of sanious matter will be forced out of their follicles.

If a patient have once had a venereal sore throat, afterwards if he have a chancre, the rubbing in of mercury will induce a sore throat; but here the ulcers will not be venereal, but similar to those of the mercurial description: and so much inflammation will attend them, that it will be quite necessary to desist from the use of medicines, or mercury, at least for a time.

With respect to venereal eruptions, they differ from all others in being of a copper colour, and having the circumscribed circle around them of inflammation; but mercury, if long continued, will cause a cutaneous eruption of the crusted kind, similar to the venereal in every respect; with the single exception, of wanting the discriminating mark, the circle of deep coloured inflammation around.

As to the swelling of the bones, they are frequently attacked with a similar disease in appearance to the venereal, but they are unattended with the nocturnal increase of the symptoms. The long continued use of mercury will occasionally produce a complaint very like it: but in all these cases, no preceding venereal symptoms having existed, will explain their distinction. They are readily relieved by the application of blisters to the part affected, and by giving the decoction of sarsaparilla. Women of delicate habit of body, in whom debilitated symptoms occur, will occasionally have nodes without their in the least partaking of the venereal: they may be removed by blisters or other stimulating applications,and by giving the mistur. myrrhæ.

There is a disease, which is occasionally met with in the nose, which by many is confounded with that resulting from the application of the venereal virus to the constitution, this is called NOLI ME TANGERE; at first sight it resembles it, but on accurate examination it will be found to differ. The best remedy is a solution of the argent. nitr. ʒi. to aqua ℥i.

The parts are to be bathed once daily with it, and afterwards the black wash is to be applied, giving at the same time tonic medicines. In one case, which baffled every usual means, it yielded to a solution of arsenic applied to it, taking this medicine internally at the same time.

The venereal disease cannot be cured by the grand specific mercury in some people, who have extremely irritable habits of body, as very soon after beginning the use of mercury, the constitution will become so much deranged as to compel the surgeon to desist from its continuance: this may be owing to debility, and frequently occurs in scrophulous patients: when this is the case mercury must be laid aside, with the exception of a mild preparation, and none will be found better than Plummer's pill. The decoct. sarsaparil. may be given at the same time. Some surgeons in extensive practice, who have patients with this irritability of fibre, have given the hydrarg. muriat. in the decoction with advantage. Van Swieten's celebrated remedy was composed of this preparation, and it is supposed De Velno's vegetable syrup is nothing more than it sweetened with molasses.

Various opinions have been entertained by different writers, as to the specific action of mercury: as an attack of fever will suspend the violence or action of the venereal poison for a time, until that fever is abated, so the use of mercury is supposed to cure the disease, by inducing a more powerful action in the system than that caused by venereal virus: as the disease might return upon the declination of the newly set up action, it is thought, that during this time, a more healthy state being produced in the constitution, has the effect of overpowering the diseased action, and thus the complaint is removed.

In administering mercury, this rule should always be kept in view, namely, that the cure of syphilis does not depend upon the violent action of the medicine, but on the gentle and long continued use of it, so as to have a slight effect upon the salivary glands: it is scarcely possible to point out a definite length of time which this medicine ought to be given in the several species of the venereal disease, with the intention of removing it. Very much must depend on the constitution of the patient; on the inveteracy or mildness of the complaint, and on several other circumstances. In chancre, it ought not to be given for a shorter time than three weeks; in bubo, four weeks; in the venereal sore throat, five weeks; in diseases of the bones, it should be continued rather longer; and in venereal rheumatism, eight weeks. Some persons are so immediately affected with mercury, that a simple dose of three grains will salivate; this is not often seen in men, but frequently in women: and persons have often been destroyed, even by the moderate use of this powerful medicine; which has, in the majority of the fatal instances, induced a sloughing of the throat and parts adjacent. Patients will occasionally be met with, in whom it is impossible to produce a salivation, though mercury is given in very large and long continued doses: hence, though no perceptible effect is produced, yet, the disease will be cured as well as if salivation were caused. Mercurial frictions, assisted by the warm bath, giving calomel, hydr. mur. pil. hydrarg. &c. have failed in promoting the least discharge from the salivary glands. To assist frictions, the feet may be put in warm water: the *best* form of mercury is certainly the ointment, and this should always be used if it can conveniently and without exposure. The next is the blue pill; this may be given in pills of five grains each, combined with one-fourth of a grain of opium; two at night and one in the morning. Calomel will affect the mouth sooner than the above, and the hydrarg. muriat. much earlier: but they are not to be preferred, as they are not so effectual in removing the disease. The hydrarg. c. cretæ is a good medicine where tenderness of the abdominal viscera exists. Confinement, in general, is unnecessary in the cure of the venereal disease.

It is said, that mercury pervades the system after being given for some time in every secretion, in its metallic form; but this idea is erroneous, as the most delicate chemical tests cannot discover it in any which I have heard of examined, as the saliva, the blood, the urine, &c. Sometimes mercury will produce such a profuse salivation, that it will be quite necessary to put a stop, or at least diminish it; this may be effected by a weak gargle, composed of two grains of the nitrate of silver, to four ounces of water, the strength of it may be increased according to circumstances: a solution of nitric acid has also been found very good as a gargle; at the time of using these, give purgatives, &c.

The tongue sometimes will be tumefied and protrude out of the mouth, so that the patient cannot draw it in; here a piece of gauze tied round the head and made to press upon the tongue will be found to reduce it in twenty-four hours. When the salivation continues profuse, the patient may be exposed cautiously to a colder atmosphere. Mercury ought ever to be given and used with great caution, and wet and damps must be avoided especially.

There is a disease, which is induced by the use of mercury, and which is occasionally destructive to life; it is termed the *erythema mercuriale:* it consists in a desquamation of the cuticle over each of the papillæ of the skin, around the roots of the hairs; it takes place also in those parts on which hairs are not to be found: a circle of inflammation begins, commonly in the groin, or thigh, or lower parts of the abdomen; afterwards it extends to other parts of the body. In this case, the scrotum is often deeply ulcerated, and the disease is accompanied with considerable constitutional irritation. The patient generally dies, with an affection of the organs of respiration, and when these symptoms make their appearance it is always a fatal sign. The spots of inflammation on the body become purple before death. It mostly arises from the patient having been exposed to cold and wet while under the influence of mercury: sometimes, however, it happens from an irritable state of the skin. The *best treatment* is to wash the whole body with equal parts of lime water and milk, giving at the same time bark and sarsaparilla. Country air will much assist in the recovery. The ungt. hydrarg. nit. or an ointment composed of lard and the acetate of lead, will be useful. A solution of the hydrarg. muriat. c. liquor. calc. has also been very beneficial.

LECTURE XXXIII.

ON SIMPLE FRACTURES.

The existence of fracture is generally easily known, by the alteration of shape which the limb undergoes; by the motion of the fractured part, and by the crepitus which may mostly be felt at the place where the bone is broken: if, however, one portion of bone be not in contact with the other, crepitus will not exist, and this sensation is not always to be depended upon; as it may sometimes be perceived when a fracture has not taken place: when a part receives a blow, inflammation is produced there, by which coagulable lymph is thrown out: the pressure of this lymph against the periosteum will induce crepitus when the part is examined, similar to what is felt when a bone is broken, but this crepitus never is perceived until inflammation has arisen in the part, which generally requires three or four days to produce in a sufficient degree; therefore, tension, spasm, &c. will come on, and if the bandages are too tightly applied at first, it will be necessary to remove them at this period.

It is generally the plan at the present time, *not to apply* any bandage on a fractured limb for four, five, or even six days; simple extension must be adopted, when the limb should be placed in an easy position, with the ends of the bone as perfectly in apposition as possible. The deposition of the jelly-like substance, which is cartilaginous, and which commences the process of ossification, *never is produced*, until the inflammation has subsided: hence, if bandages are employed in the first instance, they should be put on *loosely*, and they must be rendered tighter towards the fifth or sixth day. From the prejudice which prevails, the practice being still pursued by surgeons of the old school, it will be necessary, in order to quiet the patient, to apply bandages immediately, but do so, as I have previously observed, *loosely:* the limb would certainly be better without them.

When the inflammatory process has subsided, the limb is as mobile as it was, subsequent to the accident; but no crepitus will be distinguishable at this time (if previously felt), the extremities of the bone being covered with a new substance. After the ninth day in young subjects, the ends of the bone begin to unite; but in persons who are more advanced in years, this does not happen until the tenth or eleventh day; and the union is complete in the small bones in about twenty-one days, but in the large, not until the fifth or sixth week: this, however, depends much upon the age and constitution of the patient. In young persons, the deposition is effected much sooner than in those who are advanced in life.

The process which goes forward to effect the union of bones in cases of simple fracture is thus: for the first four days, blood is effused between the ends of the bones, which also pervades the cellular membrane: this is ultimately absorbed, as it has not the least tendency or share in producing the union between the ends of the bone; towards the fourth day, inflammation commences in the bone, and this process pours out a jelly-like substance between the bone and periosteum; this effusion continues from the fifth until the tenth day, and constitutes the new callus, which is exactly similar to that substance into which ossific matter is deposited by the arteries in the fœtus, resembling very much cartilage: ossific matter is deposited by the vessels in this substance in patches, without any regular order being apparent: the earthy matter is found to consist of animal gluten and phosphate of lime. Thus a fracture is united in the same way that bones are originally formed.

When fractured bones are united in direct apposition, the jelly-like substance becomes poured out of the mouths of the vessels in a circular direction around the broken extremities of the bone, and the ossific matter is deposited in this cartilaginous substance: but, if the fractured ends are not directly in contact, the cartilage thus formed, does not completely cover the broken ends, and the parts thus protruding are taken up by the absorbent vessels.

Callus newly formed, is very vascular, but in a similar manner to those in a cicatrix, the vessels here become diminished in their diameter in the course of time. This callus consists of a solid substance and cancelli. A new periosteum is also formed over it, being an elongation or production of the original periosteum. When two portions of bone are laying in contact, the periosteum, covering and intervening between them, is taken up by the absorbent vessels. In the formation of this callus, it sometimes happens, that it is deposited in a superfluous quantity; even to such a degree as to produce an increased size in the bone: this abundance is arising from a very extensive laceration of the parts, which induces an undue degree of inflammatory action in the vessels depositing the ossific matter; in order to repress its growth, in the first instance, endeavour to allay the inflammation by the application of leeches to the circumjacent parts, and afterwards when the entire inflammation has subsided, by pressure and the empl. ammon. c. hydrarg.—When the fractures are oblique, callus is slow in being deposited; in all oblique fractures, be very careful to keep the bones directly in apposition; the limb should be examined frequently, and extension ought to be made very often.

It will not unfrequently happen, that no callus will be formed; but a substance similar to ligament, of an elastic nature, will form an union between the bones; when this is the case it has been advised by Mr. White of Manchester, to cut down on the fractured part, and saw off the extremities of the bone;

but this operation is now deprecated, and it is advised never to perform it: as from the experience of men, who have had the greatest opportunities for observation, that it is never successful, that is, the production of bone in the place of the substance removed by the operation never takes place. An exfoliating piece of bone intervening between the fractured terminations, will impede the formation of callus, and thus prevent union; here the before-mentioned operation might be performed to extricate the piece.

The only examples of the first kind which I ever heard of, in which the operation succeeded, were two, but in both these the constitutions had undergone a complete alteration; the patients having experienced attacks of typhus fever, subsequent to the operation. Thus people have been exposed to contagion with the intention of effecting a formation of callus; they have been prescribed a mercurial course, which will not produce the deposition of ossific matter when union has once been formed by this ligamentous substance.

Sometimes union will not be obtained for a considerable length of time, but in some cases, this desirable effect has taken place by a case of leather being made, adapted to the shape of the limb, and bound upon it very tight. Spasms will now and then occur, and ultimately destroy life; large doses of opium must in these cases be given. A simple fracture is not entirely devoid of danger, as many instances are known to the contrary. In old people, where the fracture is near a joint, it most frequently proves fatal. In persons of bad habit of body a high degree of inflammation comes on, and proves destructive to the vital principle. Vesication will occasionally extend over the whole surface of a limb, which generally is owing to the fracture being accompanied with contusion, more or less.

I have heard a great deal said lately, as to the mode of union, as if it were a new idea, that the cartilage was first formed, and that ossific matter was deposited in it. I will maintain it is no such thing: Mr. Hunter says, "the union of bones is much more tedious than the union of soft parts of the body, because cartilage is to be formed first, then bone."

TIBIA AND FIBULA.

When the tibia and fibula are fractured, it is very soon ascertained by running the finger along the bones where nearest to the surface. When the tibia is broken separately, it is generally about five inches from the malleolus internus; and when the fibula is broken, it is mostly about three inches from the malleolus externus, the empl. sapon. on leather, should be first applied, but not tightly, in order that room may remain for tension, which always comes on soon after the accident: over this the eighteen tailed bandage should be secured, having the strap on each side: this bandage is very much superior to a roller, as if it were put on too tight, or the limb swelled much, it may readily be loosened, and may be removed without moving the limb: over this, two splints made of wood, copper, or whalebone, covered by linen, are to be secured. The best position for the limb is on the side, and the foot should be kept in a line with the patella.

OS FEMORIS.

Here apply the empl. sapon. the eighteen tailed bandage and three splints: one long splint should be placed on the outer side of the limb, the next in length on the anterior part of the thigh, and the shortest on the inner side; they should be lined with tow or wool. Two pillows will be required, one to reach from the buttock to the heel, and a smaller one to be placed under the knee, which should be raised in order to relax the muscles of the thigh. It is never the case that the femur unites directly in apposition. The best position for the thigh during the progress of the cure, is on the heel. The thigh bones of children mostly unite very well, if properly attended to; the many tailed bandage ought not to be applied in children, as a roller will serve the purpose of keeping a due degree of pressure upon the bone much better than the bandage. Fracture boxes, when properly made, answer very well for adults, but in young subjects they are seldom fixed suitable to the limb, and are not so necessary, as the bones unite much sooner.

CLAVICLE.

When this happens, the sternal extremity of the bone is found to be higher than the other, on account of the latter being drawn down by the weight of the arm. To remedy this, and secure the ends of the bone as nearly in contact as possible, the stilette bandage being five or six yards in length, made of linen, must be applied over the shoulders, and passing on the back in the shape of a figure of eight: a short sling will be necessary also to support the arm in a natural position. This bone seldom unites in an even manner; and to effect as perfect an union as possible, Dr. Haighton has invented a bandage having two openings to receive the shoulders, and a strap and buckle attached to them to buckle upon the back.

OS HUMERI.

Two rollers and two splints are required. Several turns of the roller should be made around the fractured part, when the two splints are to be placed, one on the inner, the other on the outer side of the arm, and the remainder of the roller is to be carried around these from the top to the bottom, in order to secure them on. The splints may be made of wood or pasteboard; the latter is the best, and being soaked in water it will adapt itself to the figure of the arm, and thus better retain the bone in its position. The arm is to be supported, but not raised by a sling, and the patient is not to be confined to his bed, as he does much better without.

RADIUS AND ULNA.

In this case, the same splints and bandages are required as when the os humeri is fractured: the splints are to be placed one on the outside and the other on the inside of the arm, and the arm must rest upon a pillow within a sling.

When the radius alone is fractured, if the treatment of it be not very judicious, impediments to motion will very often remain ever after. Here two rollers and two splints are requisite; but the latter are not to extend beyond the wrist, as the object principally to be attended to, is to allow of the arm hanging down, and also to keep the thumb uppermost, having the palm of the hand applied flat towards the breast. This position of the limb will prevent the pronator quadratus drawing the lower extremity of the broken bone out of its apposition with the other portion.

RIBS AND STERNUM.

A fracture of the ribs requires the same treatment as a fracture of the sternum. A fracture of the ribs often proves dangerous, particularly when the force occasioning it was great, and several of them have been broken. If a single rib be fractured little pain ensues, and no ill consequences; but, if several are in this state, the patient will frequently fall a victim to the effects caused. He will die from extravasation of blood into the cavity of the chest, occasioned by the rupture of the intercostal arteries: this will produce dyspnœa, from matter which will form within the chest. On dissection the matter will be found, and a clot of blood also floating in it. He may die from the point of the fractured rib puncturing the lungs, and producing emphysema; and this appearance will often occur, however, without any bad consequences ensuing; but when the lungs are much lacerated, death ensues from emphysema and inflammation combined. A case has occurred where the end of a broken rib punctured the spleen, and occasioned death.

It sometimes happens, that the ribs upon both sides are fractured, causing great danger. No bandage ought to be applied in this case, otherwise pressure will be made upon the lungs, and unpleasant symptoms produced. The chief dependance will be in perfect quiet, and the antiphlogistic regimen, using purgatives, bleedings, &c.

When the ribs on one side only are injured, a roller from seven to eight yards in length, and from four to six inches in breadth, ought to be made use of. It should be made of flannel cut from selvage to selvage. It ought to be applied as tight as possible, and after two or three turns have been made, a piece of stiff pasteboard should be placed directly upon the fractured ends, and this will assist greatly in preventing the action of the intercostal muscles, which will be the great object to be attained. A fracture of the ribs may be discovered by placing the hand on the painful part, and when a deep inspiration is made, a sensation of crepitus will be plainly conveyed to the fingers.

LOWER JAW.

This bone is not unfrequently fractured near the angle or symphysis by blows received on the opposite side to that on which the fracture is caused. A sling of wash leather must be had recourse to, with a hole in the centre to admit the chin; two tapes attached to the upper part of this must pass over the forehead, and be made to fasten at the vertex, in order to keep the jaw from falling down; and two tapes are to be carried along the course of the jaw to the occiput, to prevent the bone from falling forward. During the progress of the cure, the patient should be supported almost entirely upon liquid, or rather thin food. There has been an instrument invented for a fracture of this bone, when near the symphysis, which answers very well; but it requires a different spring if the fracture be at the back part of the jaw; a patient can eat as usual, after wearing it three weeks.

PATELLA.

The patella, from its situation, is very much exposed to accidents, and hence it is often seen fractured: it is very rarely the fractures are longitudinal, being mostly transverse. The fracture lengthways has been known to occur in a few instances.—When it is broken in the latter direction, it will unite again through the medium of callus, as the ends of the bone can be brought sufficiently near for the vessels of the bone to shoot into the effused fluid, and deposit an earthy matter.

When the patella is fractured transversely, the upper portion is drawn up from the lower by the action of the rectus and vasti muscles, to some distance between one and six inches. This accident happens most frequently from falling upon the knee, and occasionally (though much less often) by the action of the muscles above mentioned alone, in jumping down stairs, &c. In consequence of the great separation which ensues, union is hardly ever effected by bone, but by a ligamentous kind of substance, this being supplied with vessels from the adjacent ligaments of the bone or joint. The effect of which is, that the bone being separated to a much greater distance than what it had been before, a weakness is produced in the extremity, which is seldom or ever recovered from, and owing to the weakness, the opposite is required to exert more force in exercise, and is often broken a short time afterwards.

If, by way of experiment, to ascertain the mode of union, and the advance made in it at different periods, the patella of a dog be divided: in one week afterwards, the coagulum of blood which had existed to this time, between the portions of bone, is found to be absorbed, and a deposition of lymph occupying its place: in two weeks, the union is completed by the formation of a firm but ligamentous substance, uniting the separated portions.

Treatment.

In the first instance, the inflammation must be moderated by leeches, and a vinegar poultice for four or five days, when bandages may be put on, but not before the inflammatory symptoms have subsided; there is often tension and swelling in the parts, so that bandages would be improper until this time. When a roller is used, a cushion ought to be placed over the upper portion of bone, and put the roller on in the form of a figure of eight; the crossing of the bandage ought to be in the ham, the lowest portion passing over the head of the tibia. The bone should not be forcibly pressed down on the first application, but it must be got lower daily, and the bandage must be gradually tightened to retain it in the position it is pressed into. To prevent a stiffness in the joint, passive motion must be used in four or five weeks after the accident has happened. The patient may be placed on a table with his leg hanging down, and he may be allowed to swing it gently backwards and forwards at first, the extent of motion may be increased daily, which will prevent the stiffness.

FRACTURE OF THE OLECRANON.

The treatment of this fracture must resemble that recommended for fracture of the patella. When the arm is bent, the detached portion will be found from two to two and a half inches drawn up the arm by the action of the triceps extensor cubiti; but if the arm be extended, the small piece will be only half an inch distant from the ulna: the arm, therefore, must be extended, and the portion of bone must be brought as nearly into contact as possible, by a bandage properly applied. Passive motion of the arm must be used in this case likewise.

CERVIX FEMORIS.

This accident almost uniformly happens to old people. It may be ascertained by the surgeon not being able to feel a crepitus, and by the limb being *shorter,* from an inch to an inch and an half, whilst the foot is turned *outwards:* this sufficiently distinguishes it from dislocation. There is pain experienced at the trochanter major, owing to the psoas and iliacus internus muscles being put on the stretch. The thigh bone can be brought forward towards the abdomen, which cannot be done to any extent when the bone is dislocated. If this fracture take place within the capsular ligament, the person must remain lame for life, as the bone will never unite again, and thus the patient is deprived of all power of using it. However, if it be not very heavy, in the course of time, he may be able to walk with the assistance of a stick: but if this be not the case, he must resort to crutches.

If the fracture have happened on the outside of the capsular ligament, the bone will unite again, but the existence of a fracture at this part is a very rare occurrence; it is thought not to occur from an accident. In fifty cases of fracture at the cervix, in two only of these did it occur on the outside of the joint; a trifling circumstance will often produce this formidable fracture, on account of the softening of the bone at this part, which it universally obtains at an advanced period of life. Various attempts have been made to cure patients, by keeping the limb extended for a long time; but none have succeeded in effecting a union.

ON COMPOUND FRACTURES.

These differ from simple fractures, in being accompanied with a wound which communicates with the bone internally, and with the air externally; so that if the external wound do not communicate with the extremities of the bone which is broken, it is not a compound fracture: therefore large wounds may be seen with fracture, and yet that fracture still be a simple one. The process of union is similar to that which takes place in a case of simple fracture, though in the latter there is no discharge of matter; but in the former there is this appearance—a cartilaginous kind of substance is deposited in the first instance between the broken ends of the bone; this is partly taken up by the absorbents, and ossific matter is replaced in lieu of it; granulations arise very soon from the surface of this, and matter is thrown out to protect them from the drying action of the air.

If a surgeon be called to a case of simple compound fracture, he should place a little dry lint over the wound, in order to arrest the flow of blood which may be issuing forth—a little pressure will easily effect this. When the bleeding has ceased, he is to make extension of the limb, in order to bring the ends of the bone into direct apposition with each other. If there be great resistance to this by the contraction of the muscles, and twitchings occur in these parts of a spasmodic kind, he must desist, and the leg being placed upon a pillow, must be wrapped in an emollient poultice for four or five days, until the irritation has abated, when extension may be made without difficulty. But supposing this degree of resistance is not met with, extend the limb as far as is desirable, then bring the edges of the wound into contact as near as possible, and cover it with dry lint: the many tailed bandage may be employed, and wooden splints, which, though not so good as pasteboard in simple fracture, yet are here much better in several points of view. The position recommended in simple fracture, may be observed generally in compound, though this must vary according to the situation of the wound. On the outside and on the heel will be the best positions for the leg, if circumstances will admit of it; but if the wound be on the outside, it may be placed inwards.

It is very desirable to unite the wound in compound fractures if possible by the adhesive process, by which the fracture is changed into a simple one, capable of being cured in a fourth part of the time which would be required to effect it, if the wound were to be filled by granulations. This being the principal object, it must always be attempted, unless the wound is accompanied with contusion of the soft parts, so as to communicate with the bone. If there be contusion, apply a poultice, in order to facilitate a quick discharge from the wound. If the wound which constitutes a compound fracture be caused by the ends of the bone, or by a sharp instrument, it may mostly be united by adhesion: adhesive plaster of any description should never be made use of, but place a piece of lint accurately over the wound, and when this becomes moist with blood, and dries, it will effectually prevent the access of air; it should be assisted by compressing the sides of the wound together by means of a roller. I succeeded some time ago in the case of William Samuel, a mason, working on an estate of the Earl of Ashburnham: the compound fracture was of the tibia and fibula—previous to my arrival a considerable hæmorrhage had occurred. When the fracture was reduced, I attempted union by adhesion, and although the wound was lacerated, it united perfectly.

DIFFICULTIES MET WITH.

The first difficulty is when the bone is much comminuted or splintered, as here the danger will be increased; by a careful and cautious examination this will be known; the pieces thus detached or loose are to be removed, observing the greatest degree of care, to avoid irritating the wound more than is absolutely necessary. If these portions of bone are not removed, they will excite excessive pain by irritating the wound, and will induce a copious discharge until they are thrown out or separated, either by nature or art. This being the case, I would advise that the surgeon should never be backward in *dilating* the wound when the bone is splintered, as the particles ought to be taken out. Large portions of bone should not be taken away if the periosteum remain on them, as they will reunite;

but if this membrane be torn off, they will never again be consolidated with the bone.

The second difficulty occurs when the surgeon is unable to reduce the portions of bone which protrude through the opening in the integuments: in this case the practitioner has two remedies; the one consists in the dilatation of the wound made, the other in the removal of the piece of bone with a saw. The first plan is always to be preferred to the second, and is most strongly recommended, unless the periosteum is stripped off the exposed piece of bone, in which case it must be taken off, otherwise it will exfoliate; and also it must be removed if the fracture be a very oblique one, as the chances are against its retaining its vitality, and the wound required to be made to replace it would be a large one.

The third difficulty is when any considerable artery is divided. I think that reasoning as to this occurrence ought not to be employed alone, but that experience must serve as a guide generally. The *anterior tibial artery* has been divided in a compound fracture, and two ligatures were put on the vessel, and the man recovered. If the *posterior tibial* be divided, it requires amputation to be performed, unless when the fracture is low down. If the *femoral artery* be opened in a compound fracture, amputation must be resorted to as the only chance of saving life. If the *brachial artery* be wounded, it is not necessary to remove the limb; the surgeon should wait the event, after having secured the vessel. In a case where the arm mortified up to the ligature after such an accident, amputation succeeded very well; therefore, though we delay, no additional danger can ensue, and a chance is afforded the patient of having his limb saved, although I must admit the chance is a very hopeless one. If the *radical or ulnar artery* were injured, I would not advise amputation on any account.

Compound fracture occasionally *extending into joints*:— When this happens into that of the ankle, the plan of treatment must be principally guided by a consideration of the age and constitution of the patient. These fractures will very frequently do well without removing the limb; but from the experience I have had, and from what I have been taught, I think that it might be laid down as a general rule to amputate almost immediately if the patient be advanced in life: also if the person be at the meridian of life, yet if he be of an irritable habit of body, or if his constitution have been injured by intemperance of any kind, the limb ought to be taken off. In these cases there has not one to my knowledge recovered without amputation, and several have fallen victims to the accident, even though the limb has been removed. In young subjects amputation is scarcely ever required, as they will mostly do well.

The next circumstance which I shall advert to, as constituting an unfavourable symptom, is the appearance of a *high degree of inflammation* on the limb three or four days after the accident has occurred. When the middle of the leg is the situation of the fracture, the inflammation will sometimes extend down to the foot, and upwards as high as the knee. If an effusion accompanies this appearance as high up as the groin, it generally portends death, and evinces the existence of a high degree of constitutional debility, in which it will be requisite to administer bark, wine, and a generous diet. Leeches will be found serviceable applied around the wound, by unloading the vessels, and enabling them to regain their original tone: after these, fomentations and poultices are to be applied, the latter of stale beer grounds, wine lees, &c. Lotions also will be useful of the liquor. ammon. acet. and spir. vin. rect. applied to the inflamed limb, whilst the poultice is on the wound. At the same time opium must be given freely, to allay the constitutional irritability, and a gentle diaphoresis promoted on the skin, by giving some saline medicines. These several symptoms mostly take place in those who have lived rather high.

Sometimes after a fracture *trismus* will make its appearance, in which case experience has taught, that the removal of the cause by amputation of the limb will not induce a relaxation of spasm. *Tetanus* is also frequently brought on by a compound fracture, when apparently not a severe one.

Amputation is occasionally required for the relief of symptoms occasioned by the existence of a portion of the fractured bone in the wound which is become dead, and locked in by the newly formed bone. Extensive laceration of the muscles and integuments will now and then require amputation; but it ought not to be done even if the laceration be to a great extent, unless accompanied with contusion.

With respect to the question, whether it is best to amputate immediately, or wait until the irritable symptoms have subsided, I have before decided, as far as I am capable of judging, that D. J. Larrey's practice is the only one to be pursued, which is, when such an operation is deemed necessary, to perform it as soon as possible.

LECTURE XXXIV.

ON SCROFULA.

The term scrofula is applied to a disorder of an inflammatory nature; but differing from other inflammatory affections, in being accompanied with original debility of the vascular system, and of the vis vitæ. When the different phenomena are examined which occur in the progress of a scrofulous malady, it is found that all the stages of inflammation are attempted, but generally are imperfectly fulfilled, in consequence of a deficiency of energy in the constitution.

When the adhesive process is going on, it is slow, weak, and imperfectly accomplished; when the suppurative, it does not terminate in the formation of genuine pus, but a curd-like matter is secreted, consisting of serum and coagulable lymph: the ulcerative process is languid and tedious in its progress; and when suppuration takes place in an absorbent gland, the progress is slow indeed.

Scrofula may be termed a disease incident to youth, and persons under the age of puberty are most subject to it; although there are exceptions to this rule (and in fact to every general one that can be laid down), yet they are comparatively rarely occurring.

Scrofula is a disease having so many leading principles, that it is well marked. It is considered a specific disease, having the power of making the adjacent parts sympathize in the same mode of action; but parts are not affected in the course of absorption. It cannot be inoculated. Mr. Hunter tells us turkies and monkies are liable to this disease, and he saw white swellings in a young boar; so that it would not appear to be confined to the human species.

The constitutions most susceptible of the disease, are those of a delicate and irritable habit, who can neither bear fatigue, heat or cold, or the action of mercury. Those of a fair complexion and light hair are more liable than those of dark: the former do not appear to have much red blood in them, the circulation being languid: this complexion, when accompanied with thick lips, is indicative of a scrofulous diathesis. Mr. Hunter never saw but one black in this country affected with scrofula.

The parts of the body most disposed to take on this disease, from apparently the slightest causes, are the lymphatic glands in every part of the body, more particularly those which are superficially seated and most exposed to the vicissitudes of the weather, &c. as those of the neck and lungs; the joints, with the soft ends of the bones, and ligaments in the hands and feet; the knee, hip, and shoulder joint, and the vertebræ of the back and loins, &c. The skin has the least tendency of any part of the body to be affected.

The first disease of this description which attacks children, is an enlargement of the mesenteric glands, termed *tabes mesenterica;* next the absorbent glands of the neck become affected and diseased; then the joints are attacked with it about the time of puberty. A person with a scrofulous disposition is liable to phthisis pulmonalis, to psoas and lumbar abscesses; enlargement of the testes, &c. In old age an increase in the size of the prostate gland has been said to be owing to scrofula, but there are some who do not attribute it to that cause. Some of the before detailed complaints may occur in the latter stages of life, but they are much seldomer met with than at earlier periods.

The distinguishing characters by which the scrofulous disposition may be known, are various. The skin is always extremely thin, whether it is light or dark; the complexion is mostly fair; the hair is often found to be lank and very fine; the pupils are dilated in a light, which would cause their contraction in children of a healthy stamina, and these children have a great degree of weakness apparent: the eyelids are red, and each of the cilia has a secretion of matter surrounding them: the upper lip is thicker than natural; the extremities of the fingers are enlarged, or chubbed as it were; also when the fingers are long and thin. Children that perspire much and have pimples making their appearance on the face. All, or some of these appearances, mark the scrofulous disposition in the constitution, and by their presence a surgeon might form his judgment tolerably correct. Persons of this disposition are either very irritable, or very indolent: in the first description of people it is a much worse disease than in those of the latter. When the patient is of an indolent disposition and habit of body, it is with difficulty cured; but in those who are irritable, the complaint is continually flying from one part to another, and is severe in its attacks, sometimes destroying life rapidly, which it seldom does in the indolent class.

Much has been said, and many arguments adduced for and against the opinion, that the disease is hereditary. Mr. Hunter asserted it was not so, and this is certainly the case with respect to the disease, as it cannot with propriety be termed hereditary, but there is scarcely any doubt but that the disposition to the disease is transmitted from parents to their children.

The predisposing causes to the complaint are those (let them be of whatever kind they may) which induce debility and a weakened state of the frame. Thus fevers of various kinds may excite it, as that attendant on measles, small-pox, scarlatina, or the mercurial fever. A great advantage is derived from the vaccine inoculation in this respect, as it leaves much less disposition to scrofula than the variolous does, as it does not excite that degree of fever which the latter mostly produces. Want of nourishment is a frequent cause of the disease in large cities, which is assisted very much by the confined air which children are constantly in the habit of breathing, and also by a deficiency of a proper quantity of clothing. The exciting causes are not very obvious in many instances.

The proximate cause of the disease consists in the original formation of a weak arterial system, and the powers of this system are much weaker in children who have a predisposition for scrofula, than those who enjoy health: the blood having as component parts a less portion of crassamentum and coagulable lymph: a proof of this is frequently met with in the dissecting room, for if it be wished to inject a scrofulous child, the injection will never be found to have passed into the extreme vessels, owing to the presence of a quantity of blood in them, which the last effort of life had not power of propelling as usual into the veins; giving evidence of the debilitated state of the vascular system. If, in consequence of the existence of an inflammatory complaint, blood be drawn from a scrofulous child, on examination it will be found to possess a smaller portion of crassamentum than that taken from a healthy child, and this will be also of a looser texture: but this last is entirely an effect of the weakened action of the arteries. The process of digestion will be found not to be so well performed, and this is to be all attributed to the want of good blood to fulfil the different offices of the assimilating system: the debility extends also to the absorbent system, as well as the vascular.

When called upon to treat this disease, a surgeon should always have in view the original debility of the vessels, and, as a primary object, attempt to remedy this as much as is in his power; and a second consideration is to form a strong and more compact crassamentum. To effect both these intentions, the surgeon has air and exercise, nourishment, and tonic medicines. All these, judiciously combined, will tend a great deal towards removing the original defective formation of the constitution. Practitioners in large towns and cities have an advantage over those in the country with respect to the first of these, by having it in their power to send their scrofulous patients into a purer air than that in which they reside; but, even in the country, great benefit is derived from directing the patients to change their place of residence. It will be of service to all if they live near the sea. It is almost absolutely necessary that they should be placed in a warm atmosphere, as they will seldom recover if allowed to remain in a cold damp air, or situation. Great attention should be paid to their taking exercise, and that of a proper kind; they must only use this whilst they are free from fatigue; and immediately upon their feeling tired, they should desist. They should have their minds exercised at the same time, and their spirits should be kept up by playing with other children, and this will prove of much more service than walking with their parents. They should have the best nourishment, but this must not be given so as to excite fever. They must have very little vegetable food: their diet should almost entirely consist of animal matter: they should be allowed to eat oftener, not less frequently, and their food should not be taken in large quantities at a time. Porter and wine must be given them, unless the latter excites heat and fever, in which case it must be laid aside. Different circumstances of the case will require different medicines. The tinct. cinch. cum tinct. ferri muriat. has been given with advantage; but as it heats and induces fever, the surgeon should have recourse to other medicines. The tinct. cinch. cum acid. muriat. is most strongly recommended, ʒiss of the latter to ℥ij. of the former;—a teaspoonful of it may be given two or three times a day: it will be found very efficacious as a tonic.

When there is extravasation, and it is wished to induce absorption, the hydrarg. muriat. cum tinct. cinch. will prove serviceable. Indeed, in every case of this description, much benefit may be derived from this medicine, particularly in scrofulous enlargements of the mesenteric glands, and glands of the neck, indolent enlargement of the joints, or scrofulous ophthalmia. The quantity of the hydrarg. muriat. should be small, the one-sixteenth part of a grain twice a day will be enough. In this proportion it has not the specific effect of mercury, but acts merely as a tonic. The mineral solution has been recommended, and certainly has been given with advantage; but those I have previously inserted, I should invariably give the preference.

ENLARGEMENT OF THE GLANDS.

The reason why the glands in the neck are most frequently affected with scrofula is on account of their being more exposed to the vicissitudes of the weather: if they are cut into, when in an indolent state, unattended with redness, they will be found to contain a substance composed of coagulable lymph, imperfectly formed, mixed with a small quantity of serum, which latter is increased if there be cutaneous inflammation to any extent. When the ulcerative process comes on, the colour of the skin is changed to a dark red, similar to that around venereal sores, and which marks debility of the system. Sometimes the whole gland will slough, but it is seldom that this takes place, as the powers of the constitution will not admit of it. These glandular enlargements sometimes destroy life; in some, by the pressure of the tumour on the larynx; in others, the ulcerative process will surround the jugular vein, and cause an absorption of its coats, so that the matter will pass into the blood-vessels. A scrofulous enlargement of the bronchial glands is sometimes attended with the formation of calcareous matter. Dr. Curry has coughed up some of these concretions.

The treatment must be similar to that of inflammation arising from any adventitious cause. A purgative of scammony, rhubarb, and calomel, must be given, and this must be repeated every fourth or sixth day, but not oftener. Mercury should never be given in scrofulous affections with the intention of inducing a mercurial effect. Evaporating lotions should be applied to the enlarged glands, composed of liquor. acet. plumb. dil. et spir. vin. If the inflammation under this plan of treatment do not abate, a leech or two had better be applied.

If suppuration, notwithstanding, should ensue, as soon as a fluctuation is evident, the abscess must be opened by a small incision made into the most prominent part of the tumour. If the abscess be large, probably it would be of more advantage to use a needle and thread as a seton to evacuate its contents. If the skin be of a purple colour, and a considerable extent of it is thin and diseased, it had much better be allowed to break without opening, as in this case it never heals kindly, and the surgeon may get into discredit for having meddled with it. A common poultice may be applied to the part after the swelling has been opened, and afterwards a lotion of sulphuric acid upon linen. When the ulcerative process has commenced, and the ulcer has degenerated (as most scrofulous sores do) into an indolent one, the ung. hydrarg. nitr. will be found advantageous, as it will cause healthy, florid granulations to shoot out. The argent. nitr. in solution, ʒj. to ℥j. may be applied once a day. The black wash covered with oiled silk will be useful. Bathing in tepid salt water, made in the proportion of an ounce of bay salt to lbj. of water, may be had recourse to, the heat about 94 degrees. The patient should remain in the bath about ten minutes, and must not go to bed immediately after using the bath, as perspiration is apt to weaken him exceedingly if he do. The bath may be used three times a week.

DISEASE OF THE MESENTERIC GLANDS.

The disease here has got the name of Tabes Mesenterica. It is marked by an increased size of the abdomen, a ravenous appetite, and if the stools are examined, matter similar to chyle will be found in them: this, in fact, is chyle, which is not taken up by the lacteals, owing to an obstruction in these glands. The ravenous appetite is owing to a deficiency of nutriment, which the body endeavours to counteract by stimulating the stomach to increased action, in consequence of which, the demand for food is much greater than if the system were supplied in a regular manner by absorption from the intestines. This disease sometimes occasions ascites. Sometimes ulceration will take place at the navel.

Treatment.

A purgative must be given occasionally of the pulv. scammon. c. hydrarg. submur.—The hydrarg. muriat. has a great and powerful effect upon this form of the disease, given in small doses combined with a tonic. The diet should be nourishing, and the patient, instead of being curbed in the indulgence of his appetite, as usually is advised, should be allowed as much as he can possibly eat, on account that the system demands this additional supply. A plaster must be applied to the abdomen: the empl. litharg. will do, but if there be any pain, the empl. sapon. may be substituted. Should dropsical accumulations come on, and the collection of water is so great as to require it, the operation of paracentesis must be performed as in the adult subject.

DISEASES OF THE JOINTS.

These are generally denominated *White Swellings*, from the integuments on the surface preserving their original uninflamed colour. Scrofulous diseases of the joints are divided into three stages, the adhesive, the suppurative, and the ulcerative. Similar to the enlargement of glands, the disease in these parts is very slow in its progress, remaining for weeks, and sometimes for months, in one stage; and when it has arrived at the suppurative, it still evinces the same degree of languor as when it attacks the glands: when ulcerations ensue, the wounds are uncommonly slow and tedious in healing.

Symptoms.—Scrofulous enlargement of a joint is seldom attended with much pain at the commencement; the patient complains of a sense of stiffness in the joint, and on minute examination at the affected part, the limb will be found shorter: sometimes, however, it will be found even longer than its fellow. Occasionally, the limb will be in a slight degree painful, coming on at intervals; yet this symptom is by no means a regular attendant upon the disease, and mostly occurs in those persons who are of an irritable disposition, and most commonly in affections of the hip-joint. In this state of stiffness and enlargement, with pain at intervals, the disease continues for years, the patient suffering very little either locally or constitutionally, further than what I have described; then, suddenly, and most frequently in the spring season, the disease takes on a more active state, the pain becomes violent, the size of the limb much increased, and a general sympathizing pain and uneasiness pervades the whole frame, so as to affect the constitution; the rest is disturbed, and the appetite and strength decrease. From these symptoms existing, a person would be led to imagine that matter will be discharged almost immediately; but this is rarely the case, as the joint will frequently lessen very much, and many weeks will elapse previous to the matter making an outlet, and then two or three inches from the seat of the disease, having insinuated itself between the muscles and integuments. Not unfrequently a fluctuation is perceptible to the touch, resembling an increased secretion of synovial fluid; at length inflammation again ensues, and ulceration commences. If the opening did not take place at some distance from the cavity of the joint, it must necessarily follow that life would be but short, unless amputation was had recourse to: this being the case, the inflammation set up in the joint is but partial. When the matter has been evacuated, it mostly occurs that the urgent symptoms will abate, and the patient remain in the same state for years, the ulcers continually discharging: the limb remains useless until anchylosis supervenes, which is caused either by the deposition of a gelatinous substance, or an osseous one, or by a direct communication between the extremities of the bones. When the ulcerative process commences in the joint, what are termed hectic symptoms come on, and under these circumstances the life of the patient is at stake, unless the limb is removed, when it is possible to do so: yet this is by no means had recourse to so frequently as it formerly was, even within these few years: indeed the operation is never resorted to, unless the constitution of the patient suffers so much that his life is brought into imminent danger by the hectic fever. When the disease has ran to its greatest height, it will mostly abate, and in the course of time anchylosis terminates the mischief, which preserves the original limb, instead of compelling the patient to use an artificial one; which is more advantageous to the patient in every respect; and it often happens, that, when the limb is amputated, the disease attacks other joints.

APPEARANCE OF THE JOINT ON DISSECTION.

If the limb of a person be dissected who has suffered from this disease, under the skin there will be found a very large quantity of fat, and this is found, though the other parts of the body are very spare: this appearance arises from a greater determination of blood being made to this part, in consequence of the irritation and inflammation present. The ligaments are found very much thickened, which is produced by the same cause. The membrane, lining the cavity of the joint, is undergoing the inflammatory process, also the suppurative and ulcerative; granulations exist on some parts of it, and ulceration going on in others; so that the principal seat of the disease is in this membrane, and the ligaments are thickened from it. Next, the cartilaginous substance covering the extremities of the bones becomes absorbed; and lastly, the bones themselves are acted upon by the absorbent vessels; the inflammatory symptoms present, stimulating these vessels to an increased action, and not unfrequently foramina are formed in the bone by the action of these. It may be remarked here, that when the epiphyses of the bone separate, they will convey the same sensation to the feel as if a fracture of the cervix of the bone had taken place, and many clever surgeons have been deceived in this manner.

Causes.—These are generally attributed to some accident, but commonly they are spontaneous, or arise from such slight accidents, as would in a healthy constitution pass away without being productive of any mischief: for instance, a child being compelled to walk a considerable distance; this will bring on so much inflammation in the membrane lining the cavity of the joint, that on the succeeding day, the little patient is rendered unable to move, without causing a great degree of pain.

Treatment.

The *first* and most essential circumstance to be attended to, is placing the affected limb in a perfect state of quietude, and all motion should be strictly prohibited; for, without this abstinence from exertion of the part is observed, it will be almost impossible to effect a cure: in fact, it is absolutely necessary, for if the synovial membrane be pressed upon by the extremities of the bones, the irritation resulting from this pressure will be a constant source of inflammation in this membrane. The *next* object to be attended to, is the keeping up a constant discharge from the skin lying above the diseased joint, and this by inducing a regular determination of blood to the surface, the inflammation going on in the cavity of the joint will be materially lessened by this obstruction of a quantity of blood, which would otherwise be determined there. To effect this desirable intention one of the best applications will be found in the liniment. ammon. cum antimon. tartar. ʒj. to ℥j. used twice a day; it will produce an eruption on the part it is applied to, after it has been used two or three days, similar in appearance to that resulting from variolous matter to the constitution: but it will disappear in a few days, unless the liniment is again applied, which ought to be done. Several eminent practitioners appear to think very highly of, and strongly recommend, this plan of treatment, in preference to any other. A vinegar poultice will produce a similar effect to the liniment: the occasional use of it will effect permanent service. In addition to either of these plans, purgatives administered once a week, or every ten days, or as often as they are found necessary, will be found beneficial, as the pulv. scammon. et hydrarg. submur. If there exist a great degree of constitutional irritation, saline medicines, with opium, must be given; but, if this should not be the case, the tinct. cinchon. cum hydrarg. muriat.; vel acid. muriat. or natron united with the cinchona will be found most serviceable. These are to be used in incipient states of the disease, often with the greatest advantage. If the parts are considerably thickened, the latter medicines will be found peculiarly of use. Great benefit is frequently derived from giving the mistur. myrrh. cum ferri, and this is more particularly advantageous in those females who are attacked with the disease about puberty. If there be a fresh accession of inflammation threatening suppuration, the application of leeches must be had recourse to; more active purgatives administered, and more frequently; fomentations, or the hot-bath, made use of every night, of the heat of 95 or 100; blisters applied and kept open by the ung. sabina; to effect this latter purpose it is necessary to *peel off the cuticle,* otherwise this effect will not be produced. As blisters are generally very inconvenient to the patient, and as they likewise produce very considerable constitutional irritation, issues may be substituted; but these should not be placed very near the joint, on account of inflammation, consequent upon the insertion of them, often extending to the synovial membrane, and thus being the cause of fresh distress instead of relief, so as to retard the cure. Many practitioners apply caustic, so as to cause afterwards a permanent discharge. But, supposing ulceration has taken place, and the matter has been discharged, the treatment required is still to excite external inflammation, though in a less degree: to effect this purpose, place blisters on the opposite side of the joint to that where the ulcerative opening exists. Issues may be made use of with a similar intention, and if the joint be not very much inflamed, the injection of some fluid into it, will be found of great service; for this purpose a solution of nitrous acid gtt. vj. to ʒiv. of aqua, will be found useful: this stimulates the vessels, and assists the formation of granulations, and at the same time, by its chemical properties, it expedites the process of exfoliation.

The disease very generally ends in a more or less degree of anchylosis. Sometimes the deposit is merely gelatinous, at others, a deposition of earthy matter takes place. If it be the first or adhesive kind, as it is termed, there is mostly some slight degree of motion remaining in the joint, and under these circumstances, a hope may be entertained of its returning to its former extent. It is by the treatment of such cases as these, that Mr. Grosvenor, of Oxford, has obtained such merited reputation. It is by friction he succeeds; one hand is rubbed up, while the other passes down on the limb, both are in motion at the same time; this plan ought to be persevered in for at least half an hour daily. A little chalk or oil on the palms of the hands will prevent excoriation of the skin on the joint. If it appears from the degree of inflammation which had taken place, a complete anchylosis may ensue, it is right to consider what degree of flexion or extension the limb ought to be placed in, in order to enable the patient to derive the most efficient services from it, in its fixed state: if it be allowed to remain straight it will be extremely inconvenient to the patient, for if the disease have existed in the knee-joint, he will be compelled to take a circuitous step, and if in the elbow, he will not be enabled to assist himself with that limb in any way whatever; therefore, considering these circumstances, rather a *bent* position will be the best.

DISEASE OF THE HIP-JOINT.

There is some degree of variation in the symptoms which generally attend a scrofulous affection of this, and the other joints of the body. The hip-joint is rather a frequent seat of the disease. The surgeon may detect the existence of this complaint by the following symptoms and appearances; at the commencement the patient will mostly complain of a great deal of pain on the inside of the knee of the affected side, though this is not always attendant: on examining the knee, no appearance of disease is present, and this being the case, he is immediately led to suspect that the affection is situated in the hip, and a surgeon knowing this, who hears a patient complain of considerable pain towards the knee, will be suspicious of the real cause. The mode of ascertaining the disease is this; desire the patient to raise his knees alternately to the abdomen, that limb which is affected will not be completely elevated as the other, and its elevation will be attended with some degree of pain: the patient should then rotate his limb, outward or inwards, which on the diseased side he will not be able to do: then placing the patient on his feet, a line should be extended from the cleft in the nates to the spine of the ilium; this being done, it will be found, that the distance is much greater on the diseased side than it is on the other: the nates also, on this side, are more prominent to the eye: the leg also, on that side, is much larger; this is in some measure the case, in consequence of effusion into the cavity of the joint, but much of this appearance will depend upon the situation of the body when examined. After the disease has been present some time the affected limb will be found shorter than the other, arising in consequence of the absorption of the acetabulum and head of the os femoris: this action of the absorbents will sometimes go on until an opening is formed between the cavities of the acetabulum and the pelvis. Cases have occurred where three abscesses have made their way and discharged themselves through the vagina, and yet the patient has recovered. This has also happened when they have burst into the rectum: but in the only instance I recollect detailed, the patient died.

The Treatment.

The application of a perpetual blister, or an issue, is required in this disease, but I should prefer the latter. The hip-bath, or a large bladder filled with hot water, and applied to the adjacent parts for a considerable length of time, will afford temporary relief, at the same time pursuing the mode of cure by medicines as before noticed.

DISTORTED SPINE.

This was first accurately detailed by Mr. Pott. The disease of the spine, by which a curvature is formed, arises in consequence of the absorption of the bodies of the vertebræ, so that the spinous and articulating processes are left in statu quo, forming the posterior projection, which mostly takes place; unless the absorption goes on more laterally, when the distortion is in that direction. The degree of projection will depend on the number of vertebræ affected; occasionally only one will be diseased: at other times many, and sometimes as large a number as seven, are affected. It commences in the inter-vertebral substance, extends to the bodies of the vertebræ, and ultimately destroys them; the consequence of which is, that pressure is made upon the spinal marrow, which will have the effect of a ligature, and produce a paralytic affection: but this differs materially from a common paralysis, as the irritation produces a rigid contraction of the muscles of the lower extremities, and this without any absorption of the bones of the spine; this is caused by the effusion of coagulable lymph, in consequence of injuries particularly occurring: if the dorsal vertebræ are the seat of this disease, the bladder is paralyzed, so that a retention of urine ensues; the rectum also loses its power, and the fæces are expelled by the peristaltic motion of the intestines alone: if the injury happens to the cervical vertebræ, the arms either partially or entirely lose the power of action. This disease will very frequently continue for years, gradually taking on an adhesive process, and ultimately getting well, by allowing the adjacent vertebræ to come in contact with each other.

It is strongly recommended, by surgeon's instrument-makers, and even by some of the profession, to have an apparatus so fixed as to keep the body of the patient in a natural position until anchylosis is formed. This practice is very wrong, as it is impossible for anchylosis to take place if the vertebræ are prevented from coming in contact. This disease often ends fatally, by proving the cause of psoas abscesses.

Issues, in the treatment of the disease, are to be principally depended on, with the same precautions as have been before recommended in the varieties of scrofula. Rest is at the same time to be advised.

ON PSOAS AND LUMBAR ABSCESSES.

These diseases properly follow that which I have last described, for they are quite of the same origin; they are beginning in the ligaments of the spine, in consequence of inflammation, or of the scrofulous disposition taking on a diseased action: matter is effused between the ligaments and the bone, and this fluid is taking its course in the direction of the psoas muscle to the upper part of the thigh; or if the pus is seated on the lateral parts of the spine, it passes backwards by the side of the vertebræ, so as to appear upon the loins; but wherever the matter makes its appearance the diseases are one and the same. The symptoms are but few: it commences with a pain in the loins, and which prevails for four or five months before there is any appearance to announce the nature of the complaint in a precise manner. The patient complains of a stiffness in the part, so as to have a difficulty in stooping. The pain often extends down to the thigh of the diseased side in the direction of the crural nerve: but if it is a lumbar abscess, the pain is experienced more in the sciatic nerve. After these symptoms have continued for a time, a swelling is perceived in the groin, in the situation of a common bubo. It first appears on the inner side of the femoral vein, between it and the pubes, not larger than a walnut: when in this state, it is very easily mistaken for a femoral hernia, it being exactly in the situation of this disease, and what still tends further to mislead, is, that on putting the finger upon it, and desiring the patient to cough, the situation will be precisely the same as if a portion of intestine were protruded. The discrimination is so difficult sometimes that a surgeon of great experience has recommended a truss. When it appears at the groin, it gradually extends downwards under the fascia lata of the thigh, and by this means is confined, while a femoral hernia is most invariably tilted back over Poupart's ligament; and this difference between them is a mark of distinction: but in addition to this, it will be found never to disappear when the patient is in a recumbent posture, nor can it be made to return as in a reducible hernia: but if, added to these, inquiry is made, if there has been long continued pain in the loins, it is scarcely possible to mistake the nature of the disease. Femoral hernia has been opened, on the supposition of its being a psoas abscess. As the swelling increases, it extends still farther down the thigh, and sometimes as far as one-third of its length, or more; so that a person would scarcely conceive the disorder to have its origin in the abdomen. After being confined under the fascia lata for some time, the matter causes the absorption of it, and appears immediately under the skin, and here an evident fluctuation will determine the nature of the complaint, for whilst it remained confined under the fascia lata, the fluctuation was indistinct. For a short time the skin that covers the tumour retains its natural colour, but it changes as the ulcerative process of the integuments comes on. At length a very small opening is formed, which allows the matter to escape, though not all at once; it is prevented from being completely emptied, by small portions of coagulable lymph, which are mixed with the matter, and plug up the opening from time to time: this is a beneficial effort instituted by nature, as otherwise fatal consequences would mostly ensue if the cavity were quite emptied at once. During the time that the abscess is forming, the constitution of the patient suffers but little, and even though a pint of matter may be collected, he may not have experienced a single rigour: perhaps, he might have perceived a slight chill, but not so great as to produce any alarm in his mind, or cause him to relax from his usual occupation; and yet, this very man, about four days after the matter has discharged itself, if it be allowed to flow off voluntarily, will have violent constitutional irritation produced in the form of severe hectic symptoms, and these will mostly destroy life, in the course of two or three weeks most probably, though the length of time will vary according to circumstances. These abscesses have been known to continue discharging for years, and this occurs more frequently by far in adults than in children.

On examination after death, the disease will be found to have commenced in the ligaments of the spine: they are found thickened, and the vertebræ absorbed, in consequence of pressure made upon them. The matter makes its way between the anterior ligaments of the spine and the bodies of the vertebræ until it reaches the psoas muscle, which, more regularly giving way to pressure, becomes the conductor of the matter externally, and the principal part of this muscle becomes absorbed in the centre, so as to form a tube, and prevents it entering the cavity of the abdomen, which, if it were to do, would cause the destruction of life in a very short time. It takes the course of the psoas until it arrives at its tendon, when it perforates the anterior side of the muscle close to the tendon of the external oblique, and then makes its way under the fascia lata. The psoas abscess does not always make its way by the inner side of the femoral vein, as it is sometimes found on the outer side of the artery.

The lumbar abscess does not always originate from the anterior ligaments of the vertebræ, but now and then from a lateral ligament under the spinous processes; this species of the disease is rather more rapid in its progress than that taking the course of the psoas muscle.

Treatment.

The first thing requisite to be done is the insertion either of issues or setons directly over the seat of the disease, for the purpose of producing external irritation, as well as a discharge. When it has made its way into the thigh, so that the abscess may be opened, it may either be done by tapping, or by a lancet, in the manner so strongly recommended by Mr. Abernethy. The thin skin, situated directly over the most prominent part of the tumour, is not to be chosen for the introduction of the instrument, but some part where the skin be not so much affected by the disease; for if the opening be made where the skin is very thin, it will seldom unite as readily as is desirable. The matter is to be discharged once in about ten days or a fortnight: this depends upon the quantity that was at first discharged. Thus, if a pound and a half be discharged on the first opening, it must be repeated when half a pound is collected in the cyst, and so on, diminishing the proportion, or rather collection, gradually. The whole contents of the abscess should *never* be discharged at one time, but in proportion to its size and quantity contained, will be the rule to evacuate it, and the discretion of the surgeon must decide how much will be advisable to take off each time. Sometimes the matter will be collected in a much shorter time than at others: the discharge still proceeds from the loins, and the surgeon is not to be discouraged if this continues for years, as it has often proved the case. A very striking case may now be seen of the continuance of this disease in the daughter of the assistant to that truly respectable and scientific surgeon, Mr. Francis, of Bexley.

As the discharge is nothing more than an effect of a diseased action set up, it is necessary that the complaint in the spine should be equally attended to as if there were no discharge; and if the practitioner do not succeed in preventing the discharge from continuing a great length of time, yet he might be able to prolong life to a great extent, when compared with the rapid fate of those who are allowed to have the abscesses trusted to nature alone.

The opening made in the abscess *should never be made large*, and the skin should be drawn aside previous to puncturing the cellular membrane or substance interposed, after having penetrated the skin. Pieces of bones have been seen to exfoliate from the spine in this disease, and then the patients have done well: probably these portions of bone retarded the cure, by keeping up the flow of matter.

The Treatment

Of *Lumbar Abscesses* will be exactly the same as Psoas in every respect. Constitutional remedies should be administered in both cases.

SCROFULOUS OPHTHALMIA.

This differs from the common species of ophthalmia in beginning with a small ulcer in the transparent cornea or tunica conjunctiva. The opacity that arises from ulceration will ever remain; but if it be the effect of scrofulous inflammation, it will go off. These ulcers get irritable, and cause considerable inflammation on the eye.

Treatment.

Aperient medicines are here requisite every fourth or sixth day. The hydrarg. muriat. given in the quantity of one-sixteenth or one-eighteenth part of a grain at a dose is eminently serviceable: it may be combined with a tonic; it should not be given in large doses, otherwise it will affect the mouth, which must be cautiously guarded against. The local treatment consists in an application of a solution of the argent. nitr. made weak. The black wash, with or without the tinct. opii, is used according to the degree of pain attendant upon the disease. The vin. opii is used with similar intentions, but many consider it not so beneficial as the spirituous, and the late Mr. Saunders coincided for one in this opinion; his opportunities of using it having been very numerous.

LIPPITUDO.

This means a scrofulous inflammation, taking place in the eye-lids, and most frequently attacking the upper. The secretion natural to the parts is changed in its nature, which glues the eye-lids together during sleep. The eye-lashes are often separated by ulceration, which attacks the edges of the eye-lids. The best remedies for these, are the ung. hydrarg. nitr. or a solution of the hydrarg. muriat. in aqua calcis. A small blister may be applied to the temples. The constitutional remedies are the same as have been recommended generally in scrofula.

SCROFULOUS TESTES,

Is an affection which generally takes place from the seventeenth to the twenty-second years of age, but the disease has been seen in a boy eight or nine years old. It mostly appears in the form of a tubercle at the anterior part of the epidydimis, though sometimes it affects the body of the testes. Dr. Haighton, on dissecting a patient, who died of this complaint, found the same kind of scrofulous matter in the vesiculæ seminales, as was contained in the epidydimis.

Of all the scrofulous affections, this most readily yields to the exhibition of mercury. Calomel, given internally, and the ung. hydrarg. c. camph. rubbed into the scrotum, are mostly employed. The disease will often attack both testes at once, yet very little pain will be produced, although they are very much enlarged. If matter forms in the testis, the function of it will certainly be destroyed.

ON RACHITIS.

Rickets is generally considered a scrofulous affection, but it occurs at a period prior to this disease showing itself. It is one of the earliest diseases which attacks the bones, and is mostly accompanied with an enlargement of the mesenteric glands; in this way, the due degree of nourishment is not transmitted to the system; which will have the effect of rendering the constitutional disease much worse than it would otherwise be. The blood, by the existence of these enlargements of the glands, is prevented from receiving a due quantity of osseous matter from the food taken into the stomach, and the bones are consequently deficient in their solid texture: they are rendered so weak as to be unable to support the weight of the body, and joints are frequently forming in the middle of cylindrical bones. I have seen a specimen of a child who had two additional joints in each os humeri, and one in each os femoris. All the natural joints are very much enlarged: the wrist is remarkably so. The head is also undergoing an alteration in its shape; it is much enlarged; the forehead is very prominent, and the fachial bones distorted in some degree. The head appears of a square figure, and is flattened at its vertex. In proportion as the head is large are the intellects of the child more acute. The bones of the cranium not affording the usual resistance to the growth of the brain, it increases more rapidly in size than in those who are healthy. The spine becomes distorted laterally, and there are always two incurvations, so as to preserve the perpendicular state of the body; the ribs, instead of being arched, are nearly straight, and this occasioning a projection of one of the shoulders, the pelvis is altered in its shape, the pubes approaching each other, and the sacrum much incurvated; the thigh, the tibia and fibula, as well as the radius and ulna, are all bent forwards. Those who are the subjects of rickets when they are young, (should they survive,) are much stronger than others at the adult age; and those persons that perform such great feats of strength are generally distorted, and have been suffering from rickets in their younger days; the reason of this is evident; the bones being deprived of their proper nourishment, and absorption going on in the usual manner, a spongy texture is formed, in which state, by the action of the muscles, the bones become more curved than in a healthy person, and when the patient regains his strength, there is a greater surface for the deposition of earthy matter.

Treatment.

The object that a surgeon would have principally in view, is that of affording the body the best nourishment, and of giving the arteries an additional power of action. The food should be stimulating, the meat should be so prepared as to admit of easy digestion; the diet should be animal food and milk; ale and wine should be allowed; very little or no vegetable matter should be permitted. The three circumstances to be recommended, are, air, exercise, and a nourishing diet. Friction upon the limbs will be of considerable advantage, in assisting the powers of the circulation by mechanical aid: it may also be serviceable to bathe the body in cold salt water twice daily; the little additional stimulus the salt gives, will assist in promoting the circulation. The child should be afterwards well rubbed over the whole surface of the body. It will be right to administer purgative medicines occasionally, and the strength of the system must be renovated by the exhibition of tonics and chalybeates. When patients have, by judicious means, acquired some additional strength, *then, and not till then,* recourse may be had to instruments for the support of the frame.

Rickets is a disease entirely of children, but there is a disease attacking adults very much resembling it, termed *Mollites Ossium.* It is very seldom met with: the bones are extremely light and spongy, owing to constant absorption, and not a due degree of deposition. This cause is not elucidated, nor has the treatment been successful.

LECTURE XXXV.

ON TUMOURS.

THE STEATOMATOUS TUMOUR,

Is generally said to be encysted, but it is not so; the character of it is lobulated, consisting of lobes united together by cellular membrane. The best mode of ascertaining precisely its nature is to tighten the skin on its surface by pressing the sides of it with the hands, which forces the contents of it upwards, when the lobulated appearance may be perceived on the surface of the skin:—an obtuse fluctuation will also be felt, as it is, when composing part of the living body, of a fluid nature, containing animal oil. It is quite unattended with pain, and only inconvenient from its bulk; but when the ulcerative process commences these tumours become painful. The size of them is various; they will acquire, if allowed to grow unmolested, an enormous magnitude. One, weighing fourteen pounds ten ounces, has been removed from the breast: another, fifteen pounds, from the back; but, the largest ever extirpated, was from the back, weighing twenty-eight pounds. These excessively large swellings are mostly situated upon the integuments of the back. Their growth may be retarded by pressure, the efficacy of which is finely illustrated in the slow advance in size of these tumours, when seated, or originating under the fascia. A roller, if judiciously applied, will prevent their gaining any great size for years: if, however, on account of their bulk they become inconvenient to the patient, it is much better to remove them. When they are found on the back, on the shoulders, on the nates, or thighs, the operation will be attended with little hæmorrhage, as the vessels supplying them are small. If the swelling be very large, it will be advisable to remove a portion of skin, by making an oval incision, carrying it through the covering, and down to the cellular membrane: a hook must be introduced into the coats of the cyst, and it must be drawn out as much as possible, at the time dissecting around it. If the swelling be not very large, securing the vessels may be delayed until the tumour is entirely removed; but if it have attained a large size, it will be found better to tie the arteries, as they are divided in dissection. It will generally be found that a patient will suffer very little constitutional irritation after the removal of a swelling of immense size of this kind, it being situated in the cellular membrane, and being a growth of the adipose cells.

A second kind of tumour is the *Encysted*, which has been not unfrequently termed Atheroma or Melviris, from its containing a substance resembling curd or honey. It is formed by the dilatation of a single cell of the cellular membrane, which has its communication with the other cells obstructed; and, as the fluid secreted into it, cannot pass into these, it gradually enlarges in size. There is very little danger attendant upon an operation in this species of tumour. When uninflamed, it contains a curd-like substance, but when the least active inflammation has existed in the vessels entering the cyst, in most instances a serous fluid will be effused, mixed with flakes of coagulable lymph. If this description of tumour should undergo the suppurative and ulcerative processes, it generally will not heal, and here caustics must be had recourse to, in order to remove the cyst. The distinguishing character of this particular swelling, is its being a circumscribed tumour, arising evidently from the cellular substance, with well-defined edges, or boundaries. This is not the case in common abscess, as in this case the swelling is extended into the adjoining cellular substance, and does not terminate so abruptly. There is a slight degree of fluctuation perceptible, and it is unattended with pain, unless at the time that it is approaching suppuration. The vessels entering it are mostly small in diameter, and it is frequently the case, that it is lined internally with a cuticle, from which hairs are produced; but these productions of the cuticle in this part, are different to those hairs growing on the surface of the body, on account of their not having any bulbs. In performing an operation, for the removal of a tumour of this kind, there will seldom be any necessity for removing a portion of the superincumbent integuments, as it never arises to any great magnitude. If the encysted tumour be the produce of parts, the removal of which would be attended with danger, from its vicinity to large blood-vessels, it will be better to adopt the plan of opening it, and evacuating its contents: and here some stimulating applications will be requisite, in order to induce the cyst to heal. A poultice is to be applied for the three or four days after an opening, then dress the inside of the cyst with the ung. hydrarg. nitr. rubr. This method may be pursued when the swelling is seated on the face, on account of its producing a less degree of deformity than if it were removed by the knife. These cysts, if very large, may also be treated as an hydrocele, by injection, zinci sulph. ʒj. aquæ rosæ lb. j. M. This application will induce the adhesive inflammation in the cavity of the cyst. Some persons appear to have the disposition to form a great number of these tumours, being generally seated on the scalp. When on the integuments of the head, the cyst is found to be very thick.

ABSORBENT GLANDULAR TUMOURS.

The absorbent glands will not unfrequently become enlarged, in persons who are apparently healthy in every respect. Cases have occurred of this kind, where they have increased to such a degree as to destroy the patient; but this does not often take place. The character of this swelling is, that it resembles the scrofulous enlargement of these glands; but in the affection I am now writing on, the glands affected are rather harder, and have the feel of a scirrhous tumour. They are very moveable, and not attended with pain. They will continue gradually enlarging for a number of years, without inducing any unpleasant effects, but when they inflame, ulcerate, and their contents are discharged, they will then produce such a degree of severe constitutional irritation that the patient will not unfrequently sink under it. The situation which they mostly occupy is the neck. They should be extirpated previous to the accession of the inflammatory symptoms. As these are originally contained in the cellular membrane, when the glands become enlarged, this is condensed around them, and forms a cyst. When they suppurate the contents is not pus, but appears similar to rice in texture, contained in a small bag. Danger exists in attempting the removal of these tumours, from their connexion with large blood vessels, when seated about the neck: therefore a surgeon ought not to operate, unless the situation which they are placed in is a favourable one for using the knife, without endangering adjacent parts of importance. Sometimes they lie so contiguous to the carotid artery, that this will be laid bare if they are removed. A case of this kind occurred to Mr. Hunter, who removed a tumour from the throat, weighing fifteen pounds, growing from among the arteries in that part. A surgeon, who had been previously consulted by the patient, told him, it must be either a madman or a fool who would attempt its removal; but Mr. Hunter was neither, and the man recovered very well, although the carotid was thus completely exposed. In removing a tumour of this description, cut down as close as possible to the cyst, and in the dissection, carry the knife directed towards the swelling, lest it is plunged among the vessels; at the same time drawing the cyst out as much as possible, by means of a hook. Each of these tumours has a considerable artery entering it, which supplies blood. When extirpated, they never return again.

FUNGUS HÆMATODES.

In these Lectures I have noticed this disease several times: I shall offer a few further observations on it. It was not unknown to Mr. Hunter; he describes it under the appellation of fungated ulcer. Since his time it has been noticed by several writers. It has its commencement in a pulpy swelling, often seated among tendons, which would induce an inexperienced surgeon to suppose it a ganglion. When it is opened, it contains nothing but grumous blood, and soon after, a luxuriant fungus will be found to arise from its internal surface. Within my own knowledge, a respectable woman applied to a surgeon of some experience, respecting a small tumour she had on her leg; he said, You live too far off, but if you will come and board near me, I will cure your leg. She did so. He *prematurely, and most imprudently*, punctured it, from which time she dated the signature of her passport for another, and, I trust, a better world. A more deplorable case I never witnessed, even among the wards of the London hospitals, where diseases are seen of the most malignant description. The fungus that arose was of a sponge-like kind, containing among its interstices a fluid which flowed on a slight degree of pressure being applied: previous to the opening, the integuments covering it, were of the usual colour, a light blue, and the veins could be seen through them much enlarged. In this stage of the disease, little pain was experienced; but when an opening was made, and the internal surface had ulcerated, it became very painful, indeed: but this symptom, I have since reason to believe, will depend upon the situation which the tumour occupies. If this be a part which is much pressed by tendons, fascia, &c. the pain will be much more severe than if it were originating from soft parts, and placed among them. The opening made, certainly facilitated and expedited the fatal termination much; not but that I allow, even if it had been left alone, it would have been possible, without amputation, to remove the disease: for, after the swelling has continued for a month, sometimes less, oftener longer, it will ulcerate, and from the opening a brownish tumour, of a cauliflower kind, will arise, which will bleed on the slightest degree of force being applied to it; indeed, from time to time, it will bleed spontaneously, and it is a very difficult matter to restrain the hemorrhage. The tumour appears to be entirely composed of a congeries of vessels, and will enlarge rapidly. If some operation be not performed, the patient will die of exhaustion, in consequence of repeated hemorrhages from the tumour. On cutting open the swelling, it is found to be composed of a cellular deposition of coagulable lymph, being excessively vascular, and if this be macerated in water, it will have the appearance of sponge.

The precise nature of the disease is still, in my opinion, involved in much obscurity. It generally occurs to persons, who are debilitated either from intemperance of any kind, or depressing passions of the mind, inducing this weakness.—One theory is this. In consequence of the body being in an unhealthy state, most of its actions partake of this affection: thus, if the adhesive inflammation be necessary to be set up in a part, the lymph which is thrown out by the increased action of the vessels, is not of an healthy kind, being loose in texture, &c.; this being the case, when the vessels shoot into it, it is incapable of compressing them sufficiently, and they attain a large size: this process continues going on until the tumour bursts, when a fungus of this description is thrown out at the opening, being somewhat of an aneurismal kind. The circumstance on which the above theory was founded, was, a patient died of enteritis, who had a fungus hæmatodes; on dissecting the abdomen, coagulable lymph was found thrown out, of a much less firm texture than that which is usually found in healthy persons, and was similar to a sponge in appearance, the cells containing grumous blood.

The origin of this disease appears to be in the fascia or aponeurosis in the first instance, afterwards other parts partake of the affection.

Mr. Burns of Glasgow, has given a good description of this disease; he terms it spongoid inflammation.

Respecting the capability of the disease being extended by absorption, some are disposed to think it is, as one case in particular occurred where the disease formed originally in the leg; being extirpated, it reappeared in the thigh, in the groin, and on the patient's death, tumours answering the description of this were found in several parts of the lungs; these were attributed to absorption; also it is observed, almost universally, that the disease reappears after being apparently extirpated, unless the limb is amputated. It is almost unnecessary to mention, that if the disease have advanced to any extent, amputation is the only resource, and it ought to be done some distance above the diseased part. I must beg leave to advise the perusal of cases detailed by Mr. Hey upon this subject. From discussions I have had on the subject with several practitioners of eminence, I have reason to think the lunar caustic has removed the disease in the incipient state. I have used it successfully in one case of a tumour on the hand, which assumed, externally, the appearance of this disease in the very early stage; and I have extirpated another tumour that presented a very similar character.

ON CUTANEOUS TUMOURS.

These are sometimes met growing from the skin alone, being an elongation of it; they are of three kinds. The *first*, consists *merely* of the growth of the skin hanging in folds without any pendulous tumour. The cellular membrane underneath, in this species of cutaneous tumour, remains unaffected by the disease. The *second* species is that where the cellular membrane grows along with the skin, and they form pendulous swellings, having small necks; they commence in the form of a small wart, and may be safely removed without the smallest chance of danger. The *third* species, is of a warty kind, and frequently will become cancerous. They mostly arise from long continued irritation on the surface of the body, or from wearing a truss. They will remain for many years without ulcerating; therefore it is wrong to apply caustic to them, as they, by so doing, are apt to degenerate into carcinomatous ulcers. They are frequently extremely vascular; and if an operation be necessary, the skin and cellular substance surrounding them, should be deeply cut out along with them.

OSSIFIC TUMOURS.

These may be subdivided into two kinds; the *first*, consist of a deposition of earthy matter between the periosteum and the substance of the bone. The mode of their production is in consequence of inflammation being set up in the bone and periosteum by some cause or other, when a cartilaginous substance is deposited between the membrane and the bone, which becomes ossified by means of the vessels going to the bone extending into it: from time to time fresh depositions take place, which also become converted into bony matter; the periosteum still serving as a covering to it. This will go on to a great extent sometimes, and the tumour will attain a large size; but they are a long time arriving at any magnitude. If they are external, they may be removed by a saw. In one case which happened to a surgeon, he bored holes into the swelling, with the idea of promoting absorption, which took place soon afterwards.

The *second* kind of *exostosis* is arising from the internal part of the bone, and originates in consequence of inflammation of the medullary membrane, producing a callus, which is thrown out: this, by its pressure on the original bone, induces an absorption of it, gradually extending in every direction, and will completely destroy the whole circumference of it. The disease does not stop when arrived at this point, but fresh deposits of earthy matter following each other, the tumour will sometimes increase to an enormous size. As to any remedies in this kind of tumour, they are never of service; the sole dependance must be placed on amputation, which ought to be had recourse to, before the constitution is injured by the disease.

SEROUS, OR HYDATID TUMOURS.

There are three different species of these. When this tumour is situated in the liver, it is formed by a great number of hydatids adhering to the internal surface of one large one, and these fill up the cavity. Each of these vesicles is fed by small vessels going into it, as in the larger ones. They are truly considered, at the present time, as consisting of animals surrounded by a fluid, and this fluid retained by a cyst. They are most frequently found in the cavity of the abdomen, on the liver, omentum, &c.; one or two cases have been met with when they were present between the bladder and rectum, in which situation they occasioned many unpleasant symptoms to both of those parts, by obstructing the execution of their functions.

The second species of hydatid tumour is that which is existing in the form of a stalk, from which several oval tumours will depend: these are most commonly found on the placenta, and those hydatid swellings occasionally met with in the cavity of the nose, growing from the pituitary membrane, partake of the nature of these.

A third species consists in those which are formed in the cellular membrane. This kind is sometimes met with, adhering to the surface of the ovarium, and when very much distended, is taken for ovarian dropsy.

BURSAL TUMOURS, OR GANGLIONS.

These tumours consist of collections of serous fluid within the bursæ mucosæ: they are met with on the different parts where these numerous bags exist, frequently on the wrist, on the fibula, and on the tibia, &c. The best mode of treatment is by bursting them by means of a blow given with a flat hard substance, as a book. When this is smartly applied, it will generally succeed in rupturing the cyst, which the fluid is contained in, but if it be impossible to effect it by this means, apply the empl. ammon. c. hydrarg. with the assistance of pressure constantly. Much advantage has been derived from the application of a blister, put on repeatedly at short intervals. If, however, the cyst be very thick, as that upon the side of the patella usually is, a needle and ligature of silk passed through it, and allowed to remain in the wound five or seven days, will excite adhesive inflammation, which will unite the sides of the cyst together.

INDEX.

DEDICATION.

INTRODUCTORY LECTURE,

LECTURE I. ....Temperature of the Blood, &c. 1.
Effects of Stimuli, 5.
———— Sedatives, 5.
———— Heat, 6.
———— Cold, *ibid.*
Constitutional Irritation, 8.
Treatment, 12.

LECTURE II.........On Inflammation, 14.
Results, or Terminations, 16.

LECTURE III. ......Inflammation continued, 20.
Original Cause, 22.
Proximate do. 23.
Treatment of Inflammation, 25.

LECTURE IV........On Adhesive Inflammation, 31.
———— Suppurative Inflammation, 34.
Of the Nature of Matter, and its Mode of Formation, 36.
ULCERATION, 38.
ABSCESSES, 40.
Treatment of do. 41.
HECTIC FEVER, 42.
Union by Granulation, 44.
CICATRIZATION, 46.

LECTURE V.........On ULCERS, 49.
Impediments to the Healing Process, 50.

Treatment, 52.
Gangrene, or Mortification, 56.
Treatment, 59.
On the Subject of Amputation, 60.

Lecture VI........On the Furunculus or Boil, 62.
Carbuncle, 63.
On Burns and Scalds, 64.

Lecture VII........On Wounds, 69.
— Incised Wounds, *ibid.*
— Contused do. 76.
— Lacerated do. *ibid.*

Lecture VIII......On Punctured Wounds, 78.
Trismus, and Tetanus, 81.
— Wounds of Arteries, 84.
— Securing the Arteries, 87.

Lecture IX........On Wounds of Veins, 91.
——————— Nerves, 93.
——————— Tendons, 94.
——————— The Abdomen, 96.
——————— Liver, &c. 99.

Lecture X..... ....On Wounds of the Chest, 101.
——————————— Pericardium and Heart, 104.
——————————— Throat, *ibid.*
——————————— Joints, 107.
——————————— Brain, 109.

Lecture XI...... ..On Gun-shot Wounds, 111.
—————————————— of the Chest, 116.
—————————————— Abdomen, 119.
—————————————— Brain, 120.
On compound Fractures occasioned by Gun-shot Wounds, 121.

Lecture XII........On Poisons, 126.
Treatment, 130.
Hydrophobia, 131.
Treatment, 133.

On VEGETABLE POISONS, 133.
Treatment, 135.
On MINERAL POISONS, 136.
Treatment, 138.

LECTURE XIII......On Injuries of the Head, 141.
———————— Cranium, &c. 142.
— Concussion, 143.
— Compression, 147.
— Fractures of the Cranium, 149.
Treatment, 150.
On Formation of Matter within the SKULL, 152.
— Trephining, 154.

LECTURE XIV.......On HYDROCELE, 157.
— The Treatment, Palliative and Radical, 161.
— The Cure by Injection, 163.

LECTURE XV........On Aneurism, 168.
— Its Mode of Formation, 171.
— The Old Method of Operating, 173.
— Mr. Hunter's Improvement, 174.
— The New Mode for Popliteal Aneurism, 176.
— Femoral Aneurism, high up, 178.
— Mr. Abernethy's Mode of Operating, 179.
— Mr. Astley Cooper's Plan, 180.
— The successful Operation for securing the Carotid Artery, by Mr. Astley Cooper, 181.
— The Mode of Operating, 182.
— Securing the Subclavian Artery, 183.
———————— Axillary Artery, 184.
— Mr. Keate's and Mr. Charles Bell's Operations, *ibid.*
— Brachial Artery, *ibid.*

LECTURE XVI.......On CATARACT, 186.
— The Treatment, 189.
——— Operation, *ibid.*
——— Mode by Extraction, *ibid.*
— Wenzel and Ware's Method, 191.

On the Difficulties to be encountered, 193.
——— Artificial Pupil, 194.
— Couching, 195.
— Breaking down the Cataract, or the Operation on the Capsula, 197.
— The Use of Belladonna, 199.
— Fistula Lacrymalis, *ibid.*
— Mr. Ware's Operation, 201.
Lecture XVII......On the Operation for the Removal of the Eye, 203.
——— Operation, 204.
On Polypi in the Nose, 205.
General Remarks, 206.
On Dropsy of the Abdomen, *ibid.*
———— Paracentesis Abdominis, 208.
On the Hare-Lip, Mode of Operating, 209.
Lecture XVIII.....On Puncturing the Bladder, 212.
— Ischuria, or Retention of Urine, 215.
— Treatment, 216.
Lecture XIX.......On the Structure of Calculi, 218.
——— Chemical Composition, 219.
——— Medical Treatment, 221.
——— Situations and Symptoms of Calculi, 223.
——— Cause of the Formation, 226.
——— Propriety of Lithotomy at certain Ages, *ibid.*
——— Necessary Precautions, 228.
——— Old Operation, 229.
——— New Method of Operating, 230.
——— Subsequent Treatment, 232.
On Lithotomy in Females, 232.
The Operation, 234.
Stone in the Prostate Gland, Urethra, &c. 235.
Lecture XX.......On Diseases of the Testicle, 237.
— Castration, 241.
— Chimney Sweeper's Cancer, 242.
— Tic Douloureux, 243.
— The Mode of Operating, 244.
— Aura Epileptica, 245.

LECTURE XXI......On Diseases of the Breast, 247.
Treatment, 248.
The Operation for its Removal, 251.

LECTURE XXII.....On Amputation, 255.

LECTURE XXIII...On Hernia, 263.
— Inguinal Hernia, 265.
Anatomical Structure, 267.
Oblique Inguinal Hernia, 269.
Diagnosis, 270.
Treatment of reducible Hernia, 271.

LECTURE XXIV....On Irreducible Hernia, 273.
Treatment, 274.
Strangulated Hernia, 275.
Treatment, 278.
Operation, 281.
Difference between Mr. Lawrence and Mr. Cooper's Mode, 284.

LECTURE XXV......On large Inguinal Hernia, 289.
— Small Hernia, not protruding through the Ring, 290.
— Direct Inguinal Hernia, *ibid.*
— Hernia Congenita, 292.
— Encysted Hernia, 293.

LECTURE XXVI....On Femoral Hernia, 295.
Diagnosis, 297.
Treatment, *ibid.*
Operation, 298.
Umbilical Hernia, 301.
Treatment, 302.
Ventral Hernia, 303.
Treatment, *ibid.*
Pudendal Hernia, 304.
Perineal do. *ibid.*

LECTURE XXVII...On Dislocations, 306.
The Lower Jaw, 306.

Cervical Vertebræ, 307.
Clavicle, 308.
Os Humeri, *ibid.*
Elbow, 311.
Wrist, 312.
Os Femoris, 313.
Patella, 315.
Tibia, 316.
Ankle, 317.
Compound Dislocation of the Ankle Joint, 318.
LECTURE XXVIII..Introductory to Gonorrhœa and Syphilis, 320.
LECTURE XXIX....On Gonorrhœa, 325.
Symptoms when in the Urethra, 326.
Treatment, 328.
LECTURE XXX.....On Strictures, 331.
The Seat of Stricture, 333.
— Cause of do. 334.
Treatment of Permanent Stricture, 335.
On Fistula in Perineo, 337.
Spasmodic Stricture, 339.
Treatment, 340.
Inflammatory Stricture, *ibid.*
Treatment, 341.
Enlargement of the Prostate Gland, *ibid.*
Treatment, 343.
LECTURE XXXI....On the Effects of Gonorrhœa on the Bladder, 344.
Treatment, 346.
Paralytic Affections, Bleedings from the Urethra, Chordee, &c. 347.
On Impotence, or Seminal Weakness, 349.
Treatment, 351.
Inflammation of the Testes, 352.
Treatment, 353.
External Gonorrhœa, 354.
On Gonorrhœa in the Female, 356.
Treatment, *ibid.*
On Gleet, 357.

LECTURE XXXII....On Syphilis, Chancre, 360.
— The Treatment, 360.
Phymosis, Paraphymosis, &c. 364.
Treatment, 365.
Sloughing of the Glans Penis, 366.
Chancres in Women, 367.
Treatment, *ibid.*
Venereal Warts, *ibid.*
——— Bubo, 369.
Treatment, 370.
Buboes in Women, 373.
Locality of Buboes, *ibid.*
Secondary Symptoms of Syphilis, 374.
Poison upon the Throat, *ibid.*
Venereal Eruptions, 376.
Treatment, 377.
Phagedenic Ulcer, 378.
Treatment, *ibid.*
Venereal Ophthalmia, 379.
——— Disease of the Bones, *ibid.*
Nodes, 380.
Treatment, 381.
Bones of the Cranium affected, *ibid.*
General Remarks on Syphilis and on its Treatment, 382.

LECTURE XXXIII...On Simple Fractures, 391.
Tibia and Fibula, 395.
Os Femoris, *ibid.*
Clavicle, 396.
Os Humeri, *ibid.*
Radius and Ulna, 397.
Ribs and Sternum, *ibid.*
Lower Jaw, 398.
Patella, 399.
Treatment, 400.
Olecranon, *ibid.*
Cervix Femoris, 401.

On Compound Fractures, 401.
Difficulties met with, 403.

Lecture XXXIV....On Scrofula, 407.
Enlargement of the Glands, 412.
Disease of the Mesenteric Glands, 413.
Treatment, 414.
Disease of the Joints, *ibid.*
Appearance on Dissection, 416.
Treatment, 417.
Disease of the Hip-Joint, 419.
Treatment, 420.
Distorted Spine, *ibid.*
Of Psoas and Lumbar Abscesses, 422.
Treatment, 424.
Scrofulous Ophthalmia and Treatment, 425.
Lippitudo, 426.
Scrofulous Testes, 427.
On Rachitis, *ibid.*
Treatment, 428.

Lecture XXXV....On Tumours; the Steatomatous Tumour, 430.
Encysted Tumour, 431.
Absorbent Glandular Tumours, 432.
Fungus Hæmatodes, 434.
Cutaneous Tumours, 436.
Ossific do. 437.
Serous or Hydatid Tumours, and Bursal Tumours, or Ganglions, 438.

THE END.

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